

Checksum3517

# The `mdframed` package <sup>1</sup>

auto-split frame environment

Marco Daniel Elke Schubert

v1.2

2012/01/08

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	2	5.5. Theorems . . . . .	12
2. Syntax	3	5.6. Footnotes . . . . .	13
3. The frames	4	6. Examples	13
4. Commands	4	7. Errors, Warnings and Messages	14
5. Options	5	8. Known Problems	15
5.1. Global Options . . . . .	6	9. ToDo	15
5.2. Global and Local Options . . . .	6	10. Acknowledgements	15
5.3. Hidden Lines . . . . .	11	A. More information	16
5.4. Frametitle . . . . .	11		

## 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.*

---

<sup>1</sup>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 load 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.

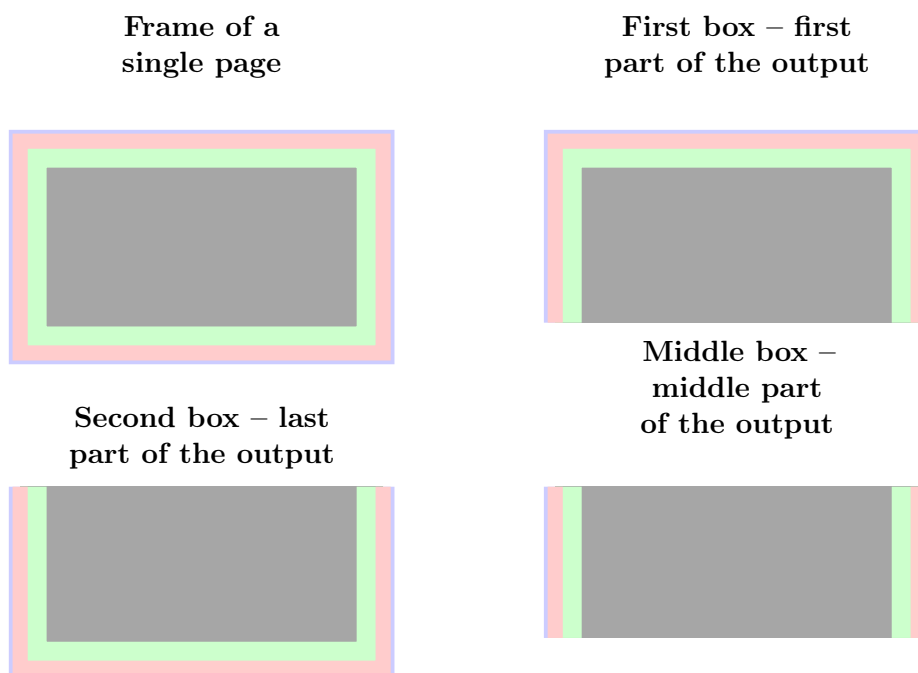


Figure 1: The basic frames

## 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 a `environmet` 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 your are avoiding breaking of non robust commands.**<sup>2</sup>

#### `\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.<sup>3</sup>

## 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 option are divided in global and local options. The global options can not be used inside `\mdfsetup`.

<sup>2</sup>Thanks to Heiko Oberdieck and Philipp Stephani [kvoptions-Declaration von Optionen schlägt fehl](#)

<sup>3</sup>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.  $\text{\LaTeX}$ -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
$\text{\LaTeX}$ -commands	<code>default</code> , <code>tex</code> , <code>latex</code> , <code>none</code> , <code>0</code>
<code>TikZ</code>	<code>tikz</code> , <code>pgf</code> , <code>1</code>
<code>PSTricks</code>	<code>pstricks</code> , <code>ps</code> , <code>postscript</code> , <code>2</code>

### 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.

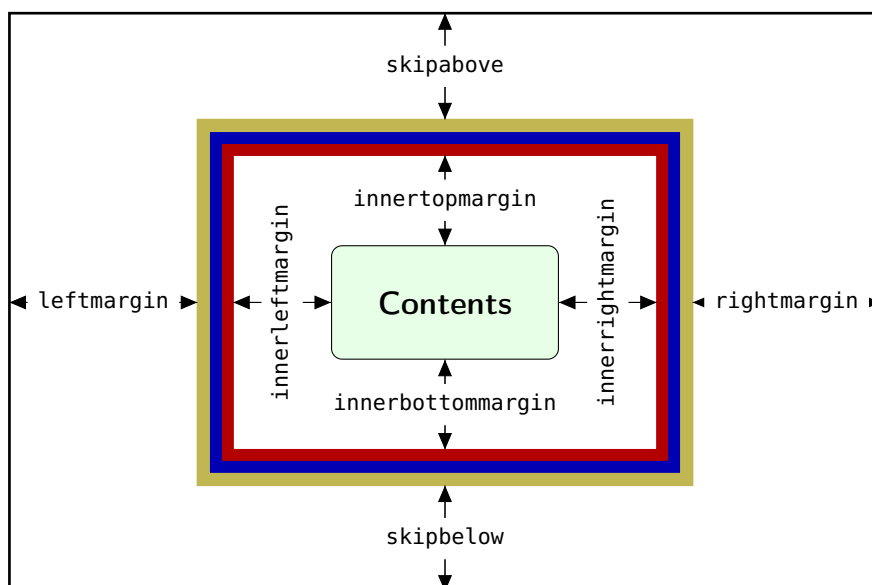


Figure 2: adjustable lengths of mdframed

`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.

`rightmargin` default=0pt

Sets the length of the right margin of the environment.

`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).

<code>userdefinedwidth</code>	default=0pt
Sets the width of the whole <code>mdframed</code> environment. The width represent the width including the line width and the inner margins. The outer margins will be ignored.	
<code>outermargin</code>	
Sets the length of the outer margin. This option is only available in <code>twoside</code> -mode.	
<code>innermargin</code>	
Sets the length of the inner margin. This option is only available in <code>twoside</code> -mode.	
<code>splittopskip</code>	default=0pt
Sets the length of the skip above the split part of the environment.	
<code>splitbottomskip</code>	default=0pt
Sets the length of the skip below the split part of the environment.	
<code>linewidth</code>	default=0.4pt
Sets the width of the line around the environment.	
<code>roundcorner</code>	default=0pt
Sets the size of the radius of the corners of the frames. This works only with <code>framemethod=TikZ</code> or <code>PSTricks</code> .	
<code>innerlinewidth</code>	default=0pt
Sets the width of the inner line around the environment. This works only with <code>framemethod=TikZ</code> or <code>PSTricks</code> .	
<code>outerlinewidth</code>	default=0pt
Sets the width of the outer line around the environment. This works only with <code>framemethod=TikZ</code> or <code>PSTricks</code> .	
<code>middlelinewidth</code>	default=linewidth
Sets the width of the middle line around the environment. This works only with <code>framemethod=TikZ</code> .	

### 5.2.2. Colored Options

<code>linecolor</code>	default=black
Sets the color of the line around the environment.	
<code>backgroundcolor</code>	default=white
Sets the color of the background of the environment.	
<code>fontcolor</code>	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

`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.

`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 `\apptopsstyle` in combination with this option you can expand the definition. The predefined styles are

- `mdfbackgroundstyle`
- `mdfframetitlebackgroundstyle`
- `mdfouterlinestyle`
- `mdfinnerlinestyle`
- `mdfmiddlelinestyle`
- `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/.sstyle}`

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`.

### 5.3. Hidden Lines

<code>topline</code>	default=true
Draws a line at the top.	
<code>bottomline</code>	default=true
Draws a line at the bottom.	
<code>leftline</code>	default=true
Draws a line on the left.	
<code>rightline</code>	default=true
Draws a line on the right.	
<code>hideallllines</code>	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.

<code>frametitle</code>	default=none
The environment gets a title. To set a title use <code>frametitle={The Title of the frame}</code> as an option of the environment.	
<code>frametitlefont</code>	default=\normalfont\bfseries
Sets the format of the <code>frametitle</code> .	
<code>frametitlealignment</code>	default=\raggedleft
Align the <code>frametitle</code> . This option must be set via <code>\mdfsetup</code> .	
<code>frametitlerule</code>	default=false
Set this key to <code>false</code> to get no line between the frame title and the text.	
<code>frametitlerulewidth</code>	default=.2pt
Sets the width of the line between the text and the title of <code>mdframed</code> .	
<code>frametitleaboveskip</code>	default=5pt
Sets the skip of the frame title to the margin above of <code>mdframed</code> .	

`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<sup>4</sup> 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[linewidth=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>]
```

How 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 environment based on the given first mandatory argument. The first environment is named like the given argument and creates a numbered theorem. The

<sup>4</sup>Thanks to Martin Scharrer and Enrico Gregorio:

[Own command to create new environment](#)

second environment is named like the first mandatory argument with a star. This environment has the same formatting but isn't numbered.

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

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

What happened? The caption of the command will be set as the frame title. In this way all option of the frametitle are available. Furthermore `mdframed` provided 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.

`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.

## 7. Errors, Warnings and Messages

The package `mdframed` provides different errors, warnings and messages in the `log`-file. Some  $\text{\LaTeX}$ -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 followings 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 unknown. 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 smaller than 3cm 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](mailto:marco.daniel@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`.

## 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`

## 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 sequentially (done by `md-frame-X.mdf`). The following figure demonstrates this.

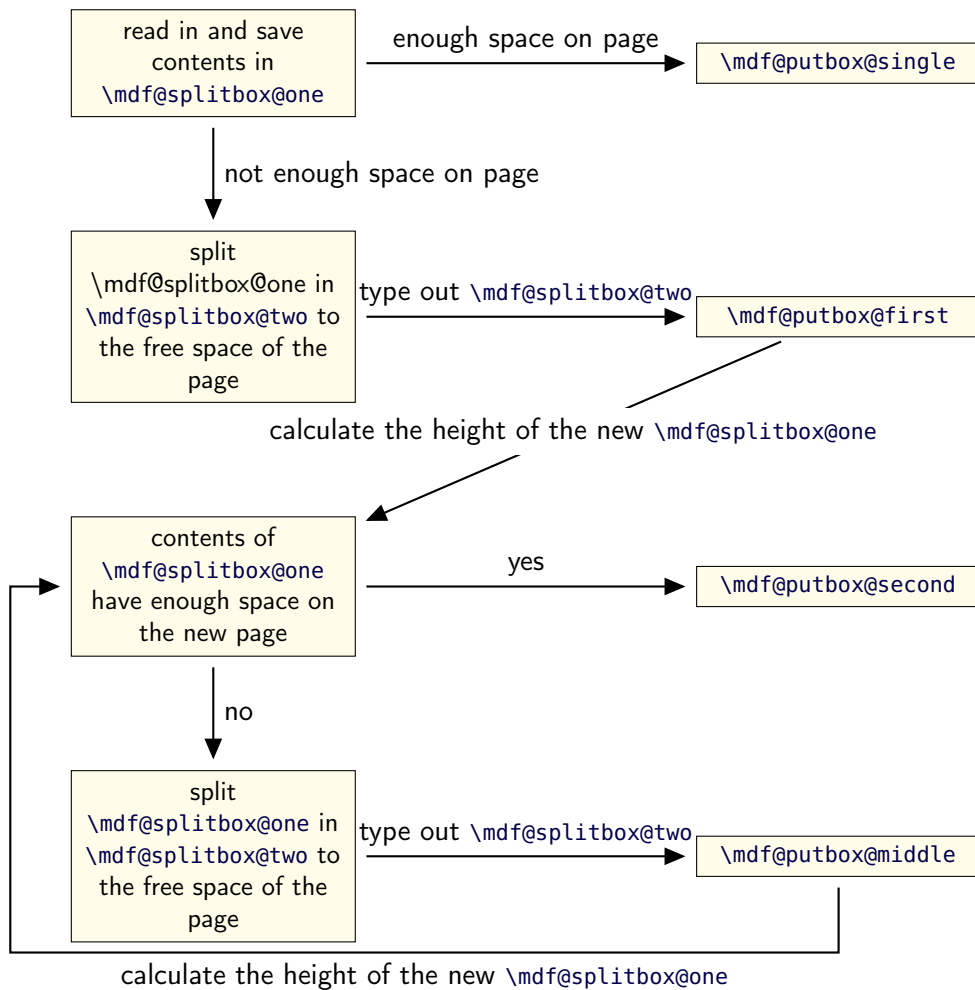


Figure 3: Setting the contents of `mdframed`

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 1.2 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  $\varepsilon$ -TeX `\dimexpr` • expand documentation • trying to fix 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 `twocolumn`-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.dtx3122012-01-0812:43:36Zmarco Rev : 312 Author : marco*

*Date : 2012-01-0813:43:36+0100(So,08.Jan2012)*

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

Set package information

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

4 \NeedsTeXFormat{LaTeX2e}
5 \ProvidesPackage{mdframed}%
6     [\mdf@maindate@svn$Id: mdframed.dtx 312 2012-01-08 12:43:36Z marco $%
7     \mdversion: \mdframedpackagename]
```

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

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

```
8 \newcommand*\mdf@PackageWarning[1]{\PackageWarning{\mdframedpackagename}{#1}}
9 \newcommand*\mdf@PackageInfo[1]{\PackageInfo{\mdframedpackagename}{#1}}
10 \newcommand*\mdf@LoadFile@IfExist[1]{%
11   \IfFileExists{#1.sty}{%
12     \RequirePackage{#1}%
13   }{%
14     \mdf@PackageWarning{The file #1 does not exist\MessageBreak
15       but needed by \mdframedpackagename\MessageBreak
16       see documentation fo further information
17     }%
18   }
19 }
```

Loading required packages

```
20 \RequirePackage{kvoptions}
21 \RequirePackage{xparse}
22 \RequirePackage{etoolbox}[2011/01/03]
23 \RequirePackage{zref-abspage}
24 \RequirePackage{color}
```

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

```
25 \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>}`

```

26 \newlength{\mdf@templength}
27 \def\mdf@iflength#1{%
28   \afterassignment\mdf@iflength@check%
29   \mdf@templength=#1\mdf@defaultunit\relax\relax
30   \expandafter\endgroup\next
31 }
32 \def\mdf@iflength@check#1{%
33   \begingroup
34   \ifx\relax#1\@empty
35     \def\next{\@secondoftwo}
36   \else
37     \def\next{\@firstoftwo}
38     \expandafter\mdf@iflength@cleanup
39   \fi
40 }
41 \def\mdf@iflength@cleanup#1\relax{}
```

`\mdf@dolist`

Loop used by *mdframed*.

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

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

Command to define a new length with a default value.

```

\mdf@option@length{<Laengebezeichnung>}{<Defaultwert>}
43 \newrobustcmd*{\mdf@option@length}[2]{%
44   \expandafter\newlength\csname mdfl@#1@length\endcsname%
45   \expandafter\setlength\csname mdfl@#1@length\endcsname{#2}%
46 }
```

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

```

47 \newrobustcmd*{\mdf@define@key@length}[1]{%
48   \define@key{mdf}{#1}{%
49     \def\@tempa{##1}
50     \mdf@iflength{\@tempa}%
51     {\csxdef{mdfl@#1}{\the\mdf@templength}}%
52     {\csxdef{mdfl@#1}{\the\mdf@length}}%
53     \expandafter\setlength\csname mdfl@#1@length\endcsname{\csname mdfl@#1\endcsname}%
54   }%
55 }
```

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

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

```

56 \def\mdf@do@lengthoption#1{%
57   \mdf@lengthoption@doubledo#1\@nil%
58 }
59 \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@tripleo

```

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

```

81 \def\mdf@do@alignoption#1{%
82   \mdf@alignoption@tripleo#1\@nil%
83 }
84 \def\mdf@alignoption@tripleo#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}%

```

```

95      \defcounter{mdf@globalstyle@cnt}{#1}%
96      \ifcase\value{mdf@globalstyle@cnt}\relax
97          %0 <- kein Grafikpaket
98      \or\mdf@LoadFile@IfExist{tikz}%
99      \or\mdf@LoadFile@IfExist{pstricks-add}%
100     \or\defcounter{mdf@globalstyle@cnt}{2}%
101         \mdf@LoadFile@IfExist{pst-node}%
102     \or\mdf@LoadFile@IfExist{pst-node}%
103     \else\mdf@PackageWarning{Unknown global style \value{mdf@globalstyle@cnt}}%
104     \fi%
105 }

```

\mdf@framemethod

```

106 \providecommand*\mdf@framemethod{}
107 \def\mdf@framemethod@i{}%
108 \def\mdf@framemethod@ii{}%
109 \def\mdf@framemethod@iii{}%

110 \define@key{mdf}{framemethod}[default]{%
111     \lowercase{\def\mdf@tempa{#1}}
112     \forcsvlist{\listadd\mdf@framemethod@i}{default,tex,latex,none,0}
113     \forcsvlist{\listadd\mdf@framemethod@ii}{pgf,tikz,1}
114     \forcsvlist{\listadd\mdf@framemethod@iii}{pstricks,ps,2,postscript}
115     \xifinlist{\mdf@tempa}{\mdf@framemethod@i}%
116         {\def\mdf@@framemethod{default}\defcounter{mdf@globalstyle@cnt}{0}}%
117     {\xifinlist{\mdf@tempa}{\mdf@framemethod@ii}%
118         {\def\mdf@@framemethod{tikz}\defcounter{mdf@globalstyle@cnt}{1}}%
119     {\xifinlist{\mdf@tempa}{\mdf@framemethod@iii}%
120         {\def\mdf@@framemethod{pstricks}\defcounter{mdf@globalstyle@cnt}{2}}}%
121     {%
122         \mdf@LoadFile@IfExist{#1}%
123     }%
124 }%
125 }%
126 \ifcase\value{mdf@globalstyle@cnt}\relax%
127     %0 <- kein Grafikpaket
128     \or\mdf@LoadFile@IfExist{tikz}%
129     \or\mdf@LoadFile@IfExist{pst-node}%
130     \or\mdf@LoadFile@IfExist{pst-node}%
131 \fi%
132 }

```

\mdf@do@lengthoption

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

```

133 \mdf@dolist{\mdf@do@lengthoption}{%
134     {skipabove==\z@},%
135     {skipbelow==\z@},%
136     {leftmargin==\z@},%
137     {rightmargin==\z@},%
138     {innerleftmargin==10pt},%
139     {innerrightmargin==10pt},%

```

```

140 {innertopmargin==0.4\baselineskip},%
141 {innerbottommargin==0.4\baselineskip},%
142 {splittopskip==\z@},%
143 {splitbottomskip==\z@},%
144 {outermargin==\z@},%
145 {innermargin==\z@},%
146 {linewidth==0.4pt},%
147 {innerlinewidth==\z@},%
148 {middlelinewidth==\expandafter\mdf@linewidth@length},%
149 {outerlinewidth==\z@},%
150 {roundcorner==\z@},%
151 {footenotedistance==\medskipamount},
152 {userdefinedwidth==\linewidth},
153 {frametitleaboveskip==5pt},
154 {frametitlebelowskip==5pt},
155 {frametitlerulewidth==.2pt},
156 {frametitleleftmargin==10pt},%
157 {frametitlerightmargin==10pt},%
158 }

```

`\mdf@do@lengthoption`

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

```

159 \mdf@dolist{\mdf@do@stringoption}{%
160   {frametitle=={}},%
161   {defaultunit==pt},%
162   {linecolor==black},%
163   {backgroundcolor==white},%
164   {fontcolor==black},%
165   {frametitlefontcolor==black},%
166   {innerlinecolor==\mdf@linecolor},%
167   {outerlinecolor==\mdf@linecolor},%
168   {middlelinecolor==\mdf@linecolor},%
169   {psroundlinecolor==\mdf@backgroundcolor},%
170   {frametitlerulecolor==\mdf@linecolor},
171   {frametitlebackgroundcolor==\mdf@backgroundcolor},%
172   {settings=={}},%
173   {frametitlesettings=={}},%
174   {font=={}},%
175   {frametitlefont==\normalfont\bfseries},%
176   {printheight==none},%
177   {alignment=={}},%
178   {frametitlealignment=={}},%
179   {theoremseparator=={:}},%
180   {theoremcountersep=={.}},%
181   {theoremtitlefont=={}},%
182   {theoremspace==\space}},%
183 }

```

`\mdf@do@booloption`

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

```

184 \mdf@dolist{\mdf@do@booloption}{%
185     {ntheorem==false},%
186     {topline==true},%
187     {leftline==true},%
188     {bottomline==true},%
189     {rightline==true},%
190     {frametitletopline==true},%
191     {frametitleleftline==true},%
192     {frametitlebottomline==true},%
193     {frametitlerightline==true},%
194     {hidealllines==false},%
195     {frametitlerule==false},%
196     {nobreak==false},%
197     {footnoteinside==true},%
198     {usetwoside==true},%
199     {repeatframetitle==false},%Noch nicht richtig implementiert
200 }

```

```
\mdf@do@alignoption
```

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

```

201 \mdf@dolist{\mdf@do@alignoption}{%
202     {left==\mdf@leftmargin@length==\z@},%
203     {center==\fill==\fill},%
204     {right==\fill==\mdf@rightmargin@length},%
205     {outer==\fill==\mdf@rightmargin@length},%not supported yet
206     {outer==\mdf@leftmargin@length==\fill},%not supported yet
207 }

```

```

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

```

Set the alignment.

```

208 \newcommand*\mdf@align{%
209 \newcommand*\mdf@makeboxalign@left{\null\hspace*\mdf@leftmargin@length}}%
210 \newcommand*\mdf@makeboxalign@right{}%
211 \define@key{mdf}{align}[left]{%
212     \ifcsundef{mdf@align@#1@left}{%
213         \mdf@PackageWarning{Unknown alignment #1\MessageBreak}%
214         \letcs\mdf@makeboxalign@left{mdf@align@left@left}%
215         \letcs\mdf@makeboxalign@right{mdf@align@left@right}%
216     }{%
217         \def\mdf@makeboxalign@left{\csuse{mdf@align@#1@left}}%
218         \def\mdf@makeboxalign@right{\csuse{mdf@align@#1@right}}%
219     }%
220 }

```

```

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

```

Option to pass options to tikz or pstricks

```

221 \def\mdf@tikzset@local{\tikzset{tikzsetting/.style={}}}

```



```

222 \define@key{mdf}{tikzsetting}{%
223   \def\mdf@tikzset@local{\tikzset{tikzsetting/.style={#1}}}%
224 }
225 \define@key{mdf}{apptotikzsetting}{%
226   \appto\mdf@tikzset@local{#1}%
227 }
228 \def\mdf@psset@local{}
229 \define@key{mdf}{pstrickssetting}{%
230   \def\mdf@psset@local{#1}
231 }
232 \def\mdfpstricks@appendsettings{}
233 \define@key{mdf}{pstricksappsetting}{%
234   \def\mdfpstricks@appendsettings{#1}%
235 }
236

```

\mdf@xcolor

**Problem with xcolor. This part must be reworked!**

```

237 \def\mdf@xcolor{}
238 \define@key{mdf}{xcolor}[none]{%
239   \def\@tempa{#1}%
240   \ifpackageloaded{xcolor}{%
241     \let\mdf@xcolor\@empty %ignoriere die Eingabe der Optionen
242     \def\@tempa{}%
243   }{}%
244   \ifx\relax\@tempa\relax\else
245     \PassOptionsToPackage{\mdf@xcolor}{xcolor}%
246     \RequirePackage{xcolor}%
247   \fi%
248 }%

```

\mdf@needspace

Defining the option needspace

```

249 \define@key{mdf}{needspace}[\z@]{%
250   \begingroup%
251     \setlength{\dimen@}{#1}%
252     \vskip\z@\@plus\dimen@
253     \penalty -100\vskip\z@\@plus -\dimen@%
254     \vskip\dimen@%
255     \penalty 9999%
256     \vskip -\dimen@%
257     \vskip\z@skip % hide the previous |\vskip| from |\addvspace|
258   \endgroup%
259 }

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

```

\mdfsetup

Short form of `\setkeys{mdf}`

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

```
\mdf@style
```

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

```
264 \define@key{mdf}{style}{%
265   \ifcsundef{mdf@definestyle@#1}{%
266     \mdf@PackageWarning{Unknown definedstyle #1^^J
267       You have to define a style ^^J
268       via \string\mdfdefinedstyle\MessageBreak
269     }%
270   }%
271   {\expandafter\expandafter\expandafter\mdfsetup%
272     \expandafter\expandafter\expandafter{\csname mdf@definestyle@#1\endcsname}}%
273 }
```

```
\mdf@print@space
```

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

```
274 \let\mdf@PackageNoInfo\@gobble
275 \newrobustcmd*{\mdf@ifstrequal@expand{%
276   \expandafter\ifstrequal\expandafter{\mdf@printheight}%
277 }
278 \newrobustcmd*{\mdf@print@space{%
279   %case "none"
280   \mdf@ifstrequal@expand{none}{\def\mdf@tempa{NoInfo}}{%
281     %case "info"
282     \mdf@ifstrequal@expand{info}{\def\mdf@tempa{Info}}{%
283       %case "warning"
284       \mdf@ifstrequal@expand{warning}{\def\mdf@tempa{Warning}}{%
285         %case "unknown"
286         \mdf@PackageWarning{Unknown key for printheight=\mdf@printheight^^J
287           use none, info or warning}%
288         \def\mdf@tempa{none}%
289       }%
290     }%
291   }%
292   \def\mdf@PackageInfoSpace{\csname mdf@Package\mdf@tempa\endcsname}%
293 }
```

```
\new...
```

Initialize all commands and length which will we used later

```
294 \newsavebox\mdf@frametitlebox
295 \newsavebox\mdf@footnotebox
296 \newsavebox\mdf@splitbox@one
297 \newsavebox\mdf@splitbox@two
298 \newlength\mdf@splitboxwidth
299 \newlength\mdf@splitboxtotalwidth
300 \newlength\mdf@splitboxheight
301 \newlength\mdf@splitboxdepth
302 \newlength\mdf@splitboxtotalheight
303 \newlength\mdf@frametitleboxwidth
```

```

304 \newlength\mdfframetitleboxtotalwidth
305 \newlength\mdfframetitleboxheight
306 \newlength\mdfframetitleboxdepth
307 \newlength\mdfframetitleboxtotalheight
308 \newlength\mdffootnoteboxwidth
309 \newlength\mdffootnoteboxtotalwidth
310 \newlength\mdffootnoteboxheight
311 \newlength\mdffootnoteboxdepth
312 \newlength\mdffootnoteboxtotalheight
313
314 \newlength\mdftotallinewidth
315
316 \newlength\mdfboundingboxwidth
317 \newlength\mdfboundingboxtotalwidth
318
319 \newlength\mdfboundingboxheight
320 \newlength\mdfboundingboxdepth
321 \newlength\mdfboundingboxtotalheight
322
323 \newlength\mdf@freevspace@length
324 \newlength\mdf@horizontalwidthofbox@length
325 \newlength\mdf@verticalmarginwhole@length
326
327 % Command to expand the tikz code. (see md-frame-1.mdf)
328 \newrobustcmd\mdfcreateextratikz{}
329

```

```

\mdf@lrbox
\endmdf@lrbox

```

Modification of the default `\lrbox` and `\endlrbox`

```

330 \def\mdf@lrbox#1{%
331 %%patch to work with amsthm
332 \mdf@patchamsthm
333 %%end patch
334 \edef\mdf@restoreparams{%
335 \parindent=\the\parindent \parskip=\the\parskip}
336 \setbox#1\vbox\bgroup
337 \begingroup
338 \mdf@horizontalmargin@equation%
339 \color@setgroup%
340 \hsize=\mdf@horizontalsofbox%
341 \columnwidth=\hsize%
342 \textwidth=\hsize%
343 \let\if@nbreak\iffalse
344 \let\if@noskipsec\iffalse
345 \let\par\@@par
346 \let\-\@dischph
347 \let'\@acci\let'\@accii\let\=\@acciii
348 \parindent\z@ \parskip\z@skip
349 \linewidth\hsize
350 \@totalleftmargin\z@
351 \leftskip\z@skip \rightskip\z@skip
352 \parfillskip\@flushglue \lineskip\normallineskip%

```

```

353 \baselineskip\normalbaselineskip%
354 \everypar{\mdf@restoreparams}\ignorespaces%
355 }
356
357
358 \def\endmdf@lrbox{\endgroup\unskip\color@endgroup\egroup}
359

```

```

\mdf@ignorevbadness
\mdf@restorevbadness

```

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

```

360 \newrobustcmd*\mdf@ignorevbadness{%
361 \edef\mdf@currentvbadness{\the\vbadness}%
362 \vbadness=\@M%
363 \afterassignment\mdf@restorevbadness}
364 \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`.

```

365 \ifpackageloaded{amsthm}{%
366 \newrobustcmd\mdf@patchamsth{%
367 \let\mdf@deferred@thm@head\deferred@thm@head
368 \patchcmd{\deferred@thm@head}{\indent}{\relax}{}{}
369 }%
370 }\let\mdf@patchamsth\relax}%

```

```

\mdf@trivlist
\endmdf@trivlist

```

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

```

371 \def\mdf@trivlist#1{%
372 \setlength{\topsep}{#1}%
373 \partopsep\z@%
374 \parsep\z@%
375 \@nmblistfalse%
376 \@trivlist%
377 \labelwidth\z@%
378 \leftmargin\z@%
379 \itemindent\z@%
380 \let\@itemlabel\@empty%
381 \def\makelabel##1{##1}%
382 \item\leavevmode\hrule \@height\z@ \@width\linewidth\relax%
383 %% \item\mbox{}\relax% second version
384 %% \item\relax% first Version
385 }
386 \let\endmdf@trivlist\endtrivlist
387 \patchcmd\endmdf@trivlist\@endparenv\mdf@endparenv{}{}
388 \def\mdf@endparenv{%
389 \addpenalty\endparpenalty\addvspace\mdf@skipbelow@length\@endpetrue}

```

390

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

```
391 \newrobustcmd*\mdf@makebox@out[2][\linewidth]{%
392 \noindent\hb@xt@\z@{%
393   \noindent\makebox[\dimexpr #1\relax][l]{#2}%
394   \hss}%
395 }%
396 \newrobustcmd*\mdf@makebox@in[2][\mdf@userdefinedwidth@length]{%
397 \noindent\makebox[\dimexpr #1\relax][l]{#2}%
398 }
```

```
\mdfdefinestyle
\mdfapptodefinestyle
```

See explanation of this commands above.

```
399 \newrobustcmd*\mdfdefinestyle[2]{%
400   \csdef{mdf@definestyle@#1}{#2}%
401 }
402 \newrobustcmd*\mdfapptodefinestyle[2]{%
403   \ifcsundef{mdf@definestyle@#1}%
404     {\mdf@PackageWarning{Unknown style #1}}%
405     {\csappto{mdf@definestyle@#1}{, #2}}%
406 }
```

```
\mdflength
\surroundwithmdframed
```

Helper macros to work with mdframed

```
407 \newrobustcmd*\mdflength[1]{\csuse{mdf@#1@length}}
408
409 \newrobustcmd*\surroundwithmdframed[2][]{%
410   \BeforeBeginEnvironment{#2}{\begin{mdframed}[#1]}%
411   \AfterEndEnvironment{#2}{\end{mdframed}}%
412 }
```

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

Defining of the new environment defintions.

```
413 \newrobustcmd*\newmdenv[2][]{%
414   \newenvironment{#2}{%
415     \mdfsetup{#1}%
416     \begin{mdframed}%
417   }{%
418     \end{mdframed}%
419   }%
420 }
```

```

421 \newrobustcmd*\renewmdenv[2][\%
422 \expandafter\let\csname #2\endcsname\relax%
423 \expandafter\let\csname end#2\endcsname\relax%
424 \newmdenv[#1]{#2}%
425 }%
426
427
428 \DeclareDocumentCommand\newmdtheoremenv{0}{ m o m o }{%
429 \ifboolexpr{ test {\IfNoValueTF {#3}} and test {\IfNoValueTF {#5}} }{%
430   {\newtheorem{#2}{#4}}{%
431     \IfValueTF{#3}{\newtheorem{#2}[#3]{#4}}{%
432       \IfValueTF{#5}{\newtheorem{#2}{#4}[#5]}{%
433         }%
434       \BeforeBeginEnvironment{#2}{%
435         \begin{mdframed}[#1]}%
436       \AfterEndEnvironment{#2}{%
437         \end{mdframed}}%
438     }
439
440 \DeclareDocumentCommand{\mdtheorem}{ 0{ } m o m o }%
441 {\ifcsdef{#2}%
442   {\mdf@PackageWarning{Environment #2 already exists\MessageBreak}}%
443   {%
444     \IfNoValueTF {#3}%
445     {%#3 not given -- number relationship
446       \IfNoValueTF {#5}
447       {%#3+#5 not given
448         \@definecounter{#2}%
449         \expandafter\xdef\csname the#2\endcsname{\@thmcounter{#2}}
450         \newenvironment{#2}[1][\%
451           \refstepcounter{#2}
452           \ifstrempy{##1}%
453             {\let\@temptitle\relax}%
454             {%
455               \def\@temptitle{\mdf@theoremseparator%
456                 \mdf@theoremspace%
457                 \mdf@theoremtitlefont%
458                 ##1}%
459             }
460           \begin{mdframed}[#1,frametitle={\strut#4 \csname the#2\endcsname\@temptitle}}}%
461           {\end{mdframed}}}%
462         \newenvironment{#2*}[1][\%
463           \ifstrempy{##1}{\let\@temptitle\relax}{\def\@temptitle{: \ ##1}}
464           \begin{mdframed}[#1,frametitle={\strut#4\@temptitle}}}%
465           {\end{mdframed}}}%
466         }%
467         {%#5 given -- reset counter
468           \@definecounter{#2}\@newctr{#2}[#5]%
469           \expandafter\xdef\csname the#2\endcsname{\@thmcounter{#2}}
470           \expandafter\xdef\csname the#2\endcsname{%
471             \expandafter\noexpand\csname the#5\endcsname \@thmcountersep
472             \@thmcounter{#2}}%
473           \newenvironment{#2}[1][\%
474             \refstepcounter{#2}
475             \ifstrempy{##1}%
476             {\let\@temptitle\relax}%

```

```

477         {%
478         \def\@temptitle{\mdf@theoremseparator%
479                     \mdf@theoremspace%
480                     \mdf@theoremtitlefont%
481                     ##1}%
482         }
483         \begin{mdframed}[#1,frametitle={\strut#4\ \csname the#2\endcsname\@temptitle}]]}%
484         {\end{mdframed}}}%
485     \newenvironment{#2*}[1][]{%
486     \ifstrepty{##1}%
487     {\let\@temptitle\relax}%
488     {%
489     \def\@temptitle{\mdf@theoremseparator%
490                     \mdf@theoremspace%
491                     \mdf@theoremtitlefont%
492                     ##1}%
493     }
494     \begin{mdframed}[#1,frametitle={\strut#4\@temptitle}]]}%
495     {\end{mdframed}}}%
496     }%
497 }%
498 {%#3 given -- number relationship
499 \global\@namedef{the#2}{\@nameuse{the#3}}}%
500 \newenvironment{#2}[1][]{%
501 \refstepcounter{#3}
502 \ifstrepty{##1}%
503 {\let\@temptitle\relax}%
504 {%
505 \def\@temptitle{\mdf@theoremseparator%
506                 \mdf@theoremspace%
507                 \mdf@theoremtitlefont%
508                 ##1}%
509 }
510 \begin{mdframed}[#1,frametitle={\strut#4\ \csname the#2\endcsname\@temptitle}]]}%
511 {\end{mdframed}}}%
512 \newenvironment{#2*}[1][]{%
513 \ifstrepty{##1}{\let\@temptitle\relax}{\def\@temptitle{: \ ##1}}
514 \begin{mdframed}[#1,frametitle={\strut#4\@temptitle}]]}%
515 {\end{mdframed}}}%
516 }%
517 }%
518 }
519

```

```

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

```

Default definition of the frame tile used by *mdframed*.

```

520 %TESTVERSION
521 % \newrobustcmd*\mdf@setopt@title{%
522 % \ifbool{mdf@frametitlerule}{\booltrue{mdf@bottomline}}{\boolfalse{mdf@bottomline}}}%
523 % \let\ifmdf@leftline\ifmdf@frametitleleftline%

```

```

524 % \let\ifmdf@topline\ifmdf@frametitletopline%
525 % \let\ifmdf@rightline\ifmdf@frametitlerightline%
526 % \let\ifmdf@bottomline\ifmdf@frametitlebottomline%
527 % \mdfsetup{innerbottommargin=\mdf@titlebelowskip@length,%
528 %           innertopmargin=\mdf@titleaboveskip@length,%
529 %           middlelinecolor=\mdf@frametitlerulecolor,%
530 %           backgroundcolor=\mdf@frametitlebackgroundcolor,%
531 %           middlelinewidth=\mdf@frametitlerulewidth@length,%
532 %           innerleftmargin=\mdf@frametitleleftmargin@length,%
533 %           innerrightmargin=\mdf@frametitlemargin@length,%
534 %           alignment=\mdf@frametitlealignment,%
535 %           skipbelow=\z@}%
536 % \def\mdf@linecolor@bottom{\color{\mdf@frametitlebottomrulecolor}}%
537 % \mdf@frametitlesettings%
538 % }
539 %
540 % \newrobustcmd*\mdf@setopt@body{%
541 %   \mdfsetup{topline=false,skipabove=\z@}%
542 %   \unskip\nointerlineskip%
543 % }
544 %
545 % \newrobustcmd\mdfframedtitleenv[1]{%
546 %   \begingroup
547 %     \mdf@setopt@title
548 %     \color@setgroup
549 %     \mdf@frametitlefont
550 %     \mdf@lrbox{\mdf@splitbox@one}%
551 %       \mdf@frametitlealignment
552 %       #1\par\unskip
553 %     \endmdf@lrbox
554 %     \mdf@ignorevbadness
555 %     \global\setbox\mdf@frametitlebox\vbox{\unvbox\mdf@splitbox@one}%
556 %     \mdf@ignorevbadness
557 %     \global\setbox\mdf@splitbox@one\vbox{\unvcopy\mdf@frametitlebox}%
558 %     \detected@mdf@put@frame%
559 %     \color@endgroup%
560 %   \endgroup
561 % }
562 % \newrobustcmd\mdfframedtitleenv[1]{%
563 %   \begingroup%
564 %     \color@setgroup%
565 %     \mdf@frametitlefont\color{\mdf@frametitlefontcolor}%
566 %     \mdf@lrbox{\mdf@frametitlebox}%
567 %       \mdf@frametitlealignment%
568 %       #1\par\unskip
569 %     \endmdf@lrbox%
570 %     \mdf@ignorevbadness%
571 %     \global\setbox\mdf@frametitlebox\vbox{\unvbox\mdf@frametitlebox}%
572 %     \global\mdfframetitleboxwidth=\wd\mdf@frametitlebox\relax%
573 %     \global\mdfframetitleboxheight=\ht\mdf@frametitlebox\relax%
574 %     \global\mdfframetitleboxdepth=\dp\mdf@frametitlebox\relax%
575 %     \global\mdfframetitleboxtotalheight=\dimexpr\ht\mdf@frametitlebox+
576 %       \dp\mdf@frametitlebox+
577 %       \mdf@titleaboveskip@length+\mdf@titlebelowskip@length\relax%
578 %     \color@endgroup%
579 %   \endgroup%
580 % }

```



```

580
581 \newrobustcmd*\mdf@frametitle{%
582   \mdfframedtitleenv{\mdf@frametitle}%
583 }
584
585 \newrobustcmd*\mdf@frametitle@use{%
586   \begingroup
587   \parskip\z@
588   \parindent\z@
589   \offinterlineskip
590   \mdf@ignorevbadness%
591   \global\setbox\mdf@splitbox@one\vbox{%
592     \unvcopy\mdf@frametitlebox%
593     \mdf@frametitlerule%
594     \unvbox\mdf@splitbox@one
595   }%
596   \mdf@ignorevbadness%
597   \global\setbox\mdf@splitbox@one\vbox{%
598     \unvbox\mdf@splitbox@one}%
599   \endgroup
600   \mdfsetup{innertopmargin=\mdf@frametitleaboveskip@length}%
601 }

```

`\mdf@checkntheorem`

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

```

602
603 \newrobustcmd*\mdf@checkntheorem{%
604   \ifbool{mdf@ntheorem}%
605     {\ifundef{\theorempreskipamount}%
606       {\mdf@PackageWarning{You have not loaded ntheorem yet}}%
607       {\setlength{\theorempreskipamount}{\z@}%
608        \setlength{\theorempostskipamount}{\z@}%
609       }%
610     }{}%
611 }

```

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

Support for footnotes.

```

612 \newrobustcmd*\mdf@footnoterule{%
613   \kern0\p@%
614   \hrule \@width 1in \kern 2.6\p@}
615 \newrobustcmd*\mdf@footnoteoutput{%
616   \ifvoid\@mpfootins\else
617     \nobreak%
618     \vskip\mdf@footnotedistance@length%
619     \normalcolor%
620     \mdf@footnoterule
621     \unvbox\@mpfootins
622   \fi%
623 }
624 \newrobustcmd*\mdf@footnoteinput{%

```

```

625 \def\@mpfn{mpfootnote}%
626 \def\thempfn{\thempfootnote}%
627 \c@mpfootnote\z@%
628 \let\@footnotetext\@mpfootnotetext%
629 }

```

```

\mdf@load@style
\mdf@styledefinition

```

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

```

630 \newrobustcmd*\mdf@load@style{%
631 \ifcase\value{mdf@globalstyle@cnt}\relax%
632 \input{md-frame-0.mdf}%
633 \or\input{md-frame-1.mdf}%
634 \or\input{md-frame-2.mdf}%
635 \or\input{md-frame-3.mdf}%
636 \else%
637 \IfFileExists{md-frame-\value{mdf@globalstyle@cnt}.mdf}%
638 {\input{md-frame-\value{mdf@globalstyle@cnt}.mdf}}%
639 {%
640 \input{md-frame-0.mdf}%
641 \mdf@PackageWarning{The style number \value{mdf@globalstyle@cnt} does not exist^^J
642 mdframed uses instead style=0 \mdframedpackagename}%
643 }%
644 \fi%
645 }%
646 \mdf@load@style
647
648 \newrobustcmd*\mdf@styledefinition{%AVOID!!!
649 \ifnumequal{\value{mdf@globalstyle@cnt}}{0}%
650 {\deflength{\mdf@innerlinewidth@length}{\z@}%
651 \deflength{\mdf@middlelinewidth@length}{\mdf@linewidth@length}%
652 \deflength{\mdf@outerlinewidth@length}{\z@}%
653 \let\mdf@innerlinecolor\mdf@linecolor%
654 \let\mdf@middlelinecolor\mdf@linecolor%
655 \let\mdf@outerlinecolor\mdf@linecolor%
656 }{}%
657 % \ifnumequal{\value{mdf@globalstyle@cnt}}{2}%
658 % {\deflength{\mdf@innerlinewidth@length}{\z@}%
659 % \deflength{\mdf@middlelinewidth@length}{\mdf@linewidth@length}%
660 % \deflength{\mdf@outerlinewidth@length}{\z@}%
661 % \let\mdf@innerlinecolor\mdf@linecolor%
662 % }{}%
663 % \ifnumequal{\value{mdf@globalstyle@cnt}}{3}%
664 % {\deflength{\mdf@innerlinewidth@length}{\z@}%
665 % \deflength{\mdf@middlelinewidth@length}{\mdf@linewidth@length}%
666 % \deflength{\mdf@outerlinewidth@length}{\z@}%
667 % \let\mdf@innerlinecolor\mdf@linecolor%
668 % }{}%
669 }

```

```

\detected@mdf@put@frame

```

Detect whether inside a non breakable environment.

```

670 \let\mdf@reserved@a\@empty
671 \newrobustcmd*\detected@mdf@put@frame{%
672   \ifmdf@nobreak%Option nobreak=true?
673     \def\mdf@reserved@a{\mdf@put@frame@standalone}%
674   \else
675     \def\mdf@reserved@a{\mdf@put@frame}%
676     \ifnum\@floatpenalty<0\relax%Detecting float
677       \if@twocolumn%
678         \ifx\@capttype\@undefined
679           \def\mdf@reserved@a{\mdf@put@frame}%
680         \else
681           \mdf@PackageInfo{mdframed inside float ^^J
682             mdframed uses option nobreak \mdframedpackagename}%
683           \def\mdf@reserved@a{\mdf@put@frame@standalone}%
684         \fi
685       \else
686         \mdf@PackageInfo{mdframed inside float ^^J
687           mdframed uses option nobreak \mdframedpackagename}%
688         \def\mdf@reserved@a{\mdf@put@frame@standalone}%
689       \fi%
690     \fi%
691     \if@minipage%
692       \mdf@PackageInfo{mdframed inside minipage ^^J
693         mdframed uses option nobreak \mdframedpackagename}%
694       \def\mdf@reserved@a{\mdf@put@frame@standalone}%
695     \fi%
696     \ifinner%
697       \mdf@PackageInfo{mdframed inside a box ^^J
698         mdframed uses option nobreak \mdframedpackagename}%
699       \def\mdf@reserved@a{\mdf@put@frame@standalone}%
700     \fi%
701   \fi%
702 \mdf@reserved@a%
703 }

```

`\mdf@hidealllines@check`

```

704 \newrobustcmd*\mdf@hidealllines@check{%
705   \ifbool{mdf@hidealllines}{%
706     \boolfalse{mdf@leftline}\boolfalse{mdf@rightline}%
707     \boolfalse{mdf@topline}\boolfalse{mdf@bottomline}%
708     \boolfalse{mdf@frametitleleftline}\boolfalse{mdf@frametitlerightline}%
709     \boolfalse{mdf@frametitletopline}\boolfalse{mdf@frametitlebottomline}%
710   }{}%
711 }

```

`\mdframed`  
`\mdframed@ii`  
`\mdframed@i`

That the user environment.

```

712 \newenvironment{mdframed}[1][[]]{%
713   \begin{group}%

```

```

714 \color@setgroup%
715   \mdfsetup{userdefinedwidth=\linewidth,#1}%
716   \mdf@hidealllines@check%
717   \mdf@twoside@checklength%
718   \let\width\z@%
719   \let\height\z@%
720   \mdf@checknththeorem%
721   \mdf@styledefinition%
722   \mdf@footnoteinput%
723   \color{\mdf@fontcolor}%
724   \ifvmode\nointerlineskip\fi%
725   \mdf@trivlist{\mdf@skipabove@length}%%
726   \ifdefempty{\mdf@frametitle}{\mdf@@frametitle}%
727   \mdf@settings%
728   \mdf@lrbox{\mdf@splitbox@one}%
729 }%
730 {\par\unskip%
731   \ifmdf@footnoteinside%
732     \def\mdf@reserveda{%
733       \mdf@footnoteoutput%
734       \endmdf@lrbox%
735       \ifdefempty{\mdf@frametitle}{\mdf@@frametitle@use}%
736       \detected@mdf@put@frame}%
737   \else%
738     \def\mdf@reserveda{%
739       \endmdf@lrbox%
740       \ifdefempty{\mdf@frametitle}{\mdf@@frametitle@use}%
741       \detected@mdf@put@frame%
742       \mdf@footnoteoutput%
743     }%
744   \fi%
745   \mdf@reserveda%
746   \endmdf@trivlist%
747 \color@endgroup\endgroup\@doendpe%\@endparenv%
748 }
749
750

```

```

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

```

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

```

751 \newtoggle{md:checktwoside}
752 \settoggle{md:checktwoside}{false}
753 \newrobustcmd*\mdf@twoside@checklength{%
754   \if@twoside
755     \ifbool{mdf@usetwoside}%
756       {\mdf@PackageInfo{mdframed works in twoside mode}%
757        \settoggle{md:checktwoside}{true}%
758        \setlength\mdf@rightmargin@length{\mdf@outermargin@length}%
759        \setlength\mdf@leftmargin@length{\mdf@innermargin@length}%
760       }%

```

```

761      {\mdf@PackageInfo{mdframed inside twoside mode but\MessageBreak
762                      works with oneside mode}%
763      \settoggl{md:checktwoside}{false}%
764      }%
765 \fi%
766 }
767
768 \newcounter{mdf@zref@counter}%keine doppelten laebes
769 \zref@newprop*{mdf@pagevalue}[0]{\number\value{page}}
770 \zref@addprop{\ZREF@mainlist}{mdf@pagevalue}
771 \newrobustcmd*{\mdf@zref@label{%
772   \stepcounter{mdf@zref@counter}
773   \zref@label{mdf@pagelabel-\number\value{mdf@zref@counter}}}%
774 }
775 \newrobustcmd*{\if@mdf@pageodd{%
776   \zref@refused{mdf@pagelabel-\the\value{mdf@zref@counter}}}%
777   \ifodd\zref@extract{mdf@pagelabel-\the\value{mdf@zref@counter}}{mdf@pagevalue}%
778   \setlength\mdf@rightmargin@length{\mdf@outermargin@length}%
779   \setlength\mdf@leftmargin@length{\mdf@innermargin@length}%
780   \else
781     \setlength\mdf@rightmargin@length{\mdf@innermargin@length}%
782     \setlength\mdf@leftmargin@length{\mdf@outermargin@length}%
783   \fi%
784 }
785 \newrobustcmd*{\mdf@@setzref{%
786   \iftoggle{md:checktwoside}{\mdf@zref@label\if@mdf@pageodd}{}}%
787 }

```

`\mdf@freepagevspace`

```

788 \newrobustcmd*{\mdf@freepagevspace{%
789   \penalty\@M \vskip 2\baselineskip \vskip\height
790   \penalty9999 \vskip -2\baselineskip \vskip-\height
791   \penalty9999
792   \ifdimequal{\pagegoal}{\maxdimen}%
793     {\mdf@freevspace@length\vsiz}%
794     {\mdf@freevspace@length=\pagegoal\relax%
795     \advance\mdf@freevspace@length by -\pagetotal\relax%
796     }%
797 }

```

`\mdf@advancelength@horizontalmargin@add`  
`\mdf@horizontalsofbox`  
`\mdf@horizontalmargin@equation`

Width of the box

```

798 \newrobustcmd*{\mdf@advancelength@horizontalmargin@sub[1]{%
799   \advance\mdf@horizontalsofbox by -\csname mdf@#1@length\endcsname\relax%
800 }
801 \newlength\mdf@horizontalsofbox
802 \newrobustcmd*{\mdf@horizontalmargin@equation{%
803   \setlength{\mdf@horizontalsofbox}{\mdf@userdefinedwidth@length}%
804   \mdf@dolist{\mdf@advancelength@horizontalmargin@sub}{%

```

```

805         leftmargin,outerlinewidth,middlelinewidth,%
806         innerlinewidth,innerleftmargin,inerrightmargin,%
807         innerlinewidth,middlelinewidth,outerlinewidth,%
808         rightmargin}%
809     \notbool{mdf@leftline}{%
810         \advance\mdf@horizontalsofbox by \mdf@innerlinewidth@length\relax%
811         \advance\mdf@horizontalsofbox by \mdf@middlelinewidth@length\relax%
812         \advance\mdf@horizontalsofbox by \mdf@outerlinewidth@length\relax%
813     }{}%
814     \notbool{mdf@rightline}{%
815         \advance\mdf@horizontalsofbox by \mdf@innerlinewidth@length\relax%
816         \advance\mdf@horizontalsofbox by \mdf@middlelinewidth@length\relax%
817         \advance\mdf@horizontalsofbox by \mdf@outerlinewidth@length\relax%
818     }{}%
819     \ifdimless{\mdf@horizontalsofbox}{3cm}%
820         {\mdf@PackageWarning{You have only a width of 3cm}}{}
821     \hsize=\mdf@horizontalsofbox%
822 }

```

`\mdf@keeplines@single`

horizontal space in relation of the lines.

```

823 \newrobustcmd*\mdf@keeplines@single{%
824     \notbool{mdf@topline}{%
825         \advance\mdf@verticalmarginwhole@length by -\mdf@innerlinewidth@length%
826         \advance\mdf@verticalmarginwhole@length by -\mdf@middlelinewidth@length%
827         \advance\mdf@verticalmarginwhole@length by -\mdf@outerlinewidth@length%
828     }{}%
829     \notbool{mdf@bottomline}{%
830         \advance\mdf@verticalmarginwhole@length by -\mdf@innerlinewidth@length%
831         \advance\mdf@verticalmarginwhole@length by -\mdf@middlelinewidth@length%
832         \advance\mdf@verticalmarginwhole@length by -\mdf@outerlinewidth@length%
833     }{}%
834 }

```

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

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

```

835 \newrobustcmd*\mdf@advancelength@verticalmarginwhole[1]{%
836     \advance\mdf@verticalmarginwhole@length by \csname mdf@#1@length\endcsname\relax%
837 }
838 \newrobustcmd*\mdf@advancelength@freevspace@sub[1]{%
839     \advance\dimen@ by -\csname mdf@#1@length\endcsname\relax%
840 }
841 \newrobustcmd*\mdf@advancelength@freevspace@add[1]{%
842     \advance\dimen@ by \csname mdf@#1@length\endcsname\relax%
843 }

```

`\mdf@reset`

Reset changes

```

844 \protected@edef\mdf@reset{\boxmaxdepth\the\boxmaxdepth

```

845 `\splittopskip\the\splittopskip}%`

`\mdf@put@frame@standalone`

Output of `mdframed` inside a non breakable environment.

```

846 \newrobustcmd*\mdf@put@frame@standalone{\relax%
847   \ifvoid\mdf@splitbox@one\relax
848     \mdf@PackageWarning{The environment is empty\MessageBreak}%
849     \let\mdf@reserved@a\relax%
850   \else
851     %Hier berechnung Box-Inhalt+Rahmen oben und unten
852     \setlength{\mdf@verticalmarginwhole@length}%
853       {\dimexpr\ht\mdf@splitbox@one+\dp\mdf@splitbox@one\relax}%
854     \mdf@dolist{\mdf@advancelength@verticalmarginwhole}{%
855       outerlinewidth,middlelinewidth,innerlinewidth,innertopmargin,
856       innerbottommargin,innerlinewidth,middlelinewidth,outerlinewidth}%
857     \mdf@keep@lines@single%
858     \def\mdf@reserved@a{\mdf@putbox@single}%
859   \fi
860   \mdf@reserved@a%
861 }
```

`\mdf@put@frame`

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

```

862 \def\mdf@put@frame{\relax%
863   \ifvoid\mdf@splitbox@one\relax
864     \mdf@PackageWarning{The environment is empty\MessageBreak}%
865     \let\mdf@reserved@a\relax%
866   \else
867     \setlength\mdfboundingboxwidth{\wd\mdf@splitbox@one}%
868     \mdf@print@space%
869     \mdf@freepagevspace@gives \mdf@freevspace@length
870     \mdf@PackageInfoSpace{\the\mdf@freevspace@length before the beginning of \MessageBreak
871       the environment ending on input line \MessageBreak}%
872     \ifdimless{\mdf@freevspace@length}{2\baselineskip}
873       {\mdf@PackageInfo{Not enough space on this page}
874         \vfill\@eject%
875         \def\mdf@reserved@a{\mdf@put@frame}%
876       }{%
877       %Hier berechnung Box-Inhalt+Rahmen oben und unten
878       \setlength{\mdf@verticalmarginwhole@length}%
879         {\dimexpr\ht\mdf@splitbox@one+\dp\mdf@splitbox@one\relax}%
880       \mdf@dolist{\mdf@advancelength@verticalmarginwhole}{%
881         outerlinewidth,middlelinewidth,innerlinewidth,innertopmargin,
882         innerbottommargin,innerlinewidth,middlelinewidth,outerlinewidth}%
883       \mdf@keep@lines@single%
884       \ifdimless{\mdf@verticalmarginwhole@length}{\mdf@freevspace@length}%
885         {%passt auf Seite%
886           \begingroup
887             \mdf@setzref
888             \mdf@putbox@single%
889           \endgroup
890           \let\mdf@reserved@a\relax}%

```

```

891             {\def\mdf@reserved@a{\mdf@put@frame@i}}%passt nicht auf Seite
892         }%
893 \fi
894 \mdf@reserved@a%
895 }

```

`\mdf@put@frame@i`

Output of the first splitted box.

```

896 \def\mdf@put@frame@i{%Box muss gesplittet werden -- Ausgabe der ersten Teilbox
897 %Berechnung der Splittgroesse -- Linien und Abstand oben
898 %\vbox to 0pt{%
899 %\rlap{\smash{\the\mdf@freeevspace@length}}%\hrule \@height\z@ \@width\hsize
900 \mdf@freepagevspace%gives \mdf@freeevspace@length
901 %Berechnung ob nur oberen Linien nur auf die Seite passe
902 \dimen@=\the\mdf@freeevspace@length%
903 \dimen@i=\mdf@innertopmargin@length%
904 \advance\dimen@i by \mdf@innerlinewidth@length%
905 \advance\dimen@i by \mdf@middlelinewidth@length%
906 \advance\dimen@i by \mdf@outerlinewidth@length%
907 \advance\dimen@i by 2\baselineskip%
908 \ifdimless{\dimen@}{\dimen@i}%
909     {\hrule \@height\z@ \@width\hsize%
910     \vfill\ject%
911     \def\mdf@reserved@a{\mdf@put@frame}%
912     }{%
913     \mdf@freepagevspace%
914     \dimen@=\the\mdf@freeevspace@length%
915     \mdf@dolist{\mdf@advancelength@freeevspace@sub}{%calculate with \dimen@
916         outerlinewidth,middlelinewidth,innerlinewidth,%
917         innertopmargin,splitbottomskip}%
918     \ifbool{mdf@topline}{%
919         \advance\dimen@ by \mdf@innerlinewidth@length%
920         \advance\dimen@ by \mdf@middlelinewidth@length%
921         \advance\dimen@ by \mdf@outerlinewidth@length%
922     }%
923     \advance\dimen@.8\pageshrink
924     \ifdimless{\ht\mdf@splitbox@one+\dp\mdf@splitbox@one}{\dimen@}%
925         {\mdf@PackageWarning{You got a bad break\MessageBreak
926             you have to change it manually\MessageBreak
927             by changing the text, the space\MessageBreak
928             or something else}%
929         \advance\dimen@ by -1.8\baselineskip\relax%
930     }{%
931 %
932     \advance\dimen@ by -1pt\relax%Box darf nicht zu Groß werden.
933     \splitmaxdepth\z@ \splittopskip\mdf@splittopskip@length%
934     \mdf@ignorevbadness%
935     \setbox\mdf@splitbox@two\vsplit\mdf@splitbox@one to \dimen@
936     \setbox\mdf@splitbox@two\vbox{\unvbox\mdf@splitbox@two}%
937     \setbox\mdf@splitbox@one\vbox{\unvbox\mdf@splitbox@one}%
938     \ifbool{mdf@repeatframetitle}{%
939         \setbox\mdf@splitbox@one\vbox{%
940             \vbox to \mdf@splittopskip@length{\hsize\z@}
941             %\par\unskip\nointerlineskip

```



```

941          \unvcopy\mdf@frametitlebox%
942          \mdf@@frametitlerule%
943          \vbox to\dimexpr
944              -\mdf@splittopskip@length+\ht\strutbox+\dp\strutbox
945              +\mdf@innertopmargin@length\relax{\hsize\z@}%
946          \unvbox\mdf@splitbox@one}%
947      }{}%
948  \ifdimgreater{\ht\mdf@splitbox@two+\dp\mdf@splitbox@two}{\dimen@}%
949      {%Falsch gesplittet
950      \mdf@PackageInfo{Box was splittet wrong\MessageBreak}%
951      \dimen@i=\dimen@
952      \advance\dimen@ by -\ht\mdf@splitbox@two
953      \advance\dimen@ by -\dp\mdf@splitbox@two
954      \advance\dimen@i by 0.5\dimen@
955      \splittopskip\z@%
956      \setbox\mdf@splitbox@one\vbox{\unvbox\mdf@splitbox@two%
957          %benoetigt um Tiefe zu haben
958          \hrule \@height\dp\strutbox \@width\z@
959          \unvbox\mdf@splitbox@one}
960      \splittopskip\mdf@splittopskip@length%
961      \mdf@ignorevbadness%
962      \setbox\mdf@splitbox@two\vsplit\mdf@splitbox@one to \dimen@i
963      \setbox\mdf@splitbox@two\vbox{\unvbox\mdf@splitbox@two}%
964      \setbox\mdf@splitbox@one\vbox{\unvbox\mdf@splitbox@one}%
965  \ifbool{\mdf@repeatframetitle}{%
966      \setbox\mdf@splitbox@one\vbox{%
967          \vbox to \mdf@splittopskip@length{\hsize\z@}
968          %\par\unskip\nointerlineskip
969          \unvcopy\mdf@frametitlebox%
970          \mdf@@frametitlerule%
971          \vbox to\dimexpr
972              -\mdf@splittopskip@length+\ht\strutbox+\dp\strutbox
973              +\mdf@innertopmargin@length\relax{\hsize\z@}%
974          \unvbox\mdf@splitbox@one}%
975      }{}%
976      }{}%
977  \ifvoid\mdf@splitbox@one
978      \mdf@PackageWarning{You got a bad break\MessageBreak
979          because the splittet box is empty\MessageBreak
980          You have to change the page settings\MessageBreak
981          like enlargethispage or something else}%
982      \setbox\mdf@splitbox@one\vbox{\unvbox\mdf@splitbox@two%
983          %benoetigt um Tiefe zu haben
984          \hrule \@height\dp\strutbox \@width\z@
985          \unvbox\mdf@splitbox@one}%
986      \setbox\mdf@splitbox@one\vbox{\unvbox\mdf@splitbox@one}%
987      \enlargethispage{\baselineskip}%
988      \def\mdf@reserved@a{\mdf@put@frame}%
989  \fi
990  \ifvoid\mdf@splitbox@two%%pruefe, ob erste Box leer ist
991      \hrule \@height\z@ \@width\hsize
992      \vfill\@eject%
993      \def\mdf@reserved@a{\mdf@put@frame}%
994  \else
995      \ifdimequal{\ht\mdf@splitbox@two}{0pt}%
996          {\hrule \@height\z@ \@width\hsize%

```

```

997      \vfill\ject%
998      \setbox\mdf@splitbox@one\vbox{\unvbox\mdf@splitbox@two\unvbox\mdf@splitbox@one}
999      \def\mdf@reserved@a{\mdf@put@frame}%
1000    }%
1001    {%
1002      \begingroup%
1003        \mdf@setzref
1004        \mdf@putbox@first%%Groesse des Splittens passt
1005      \endgroup%
1006      \hrule \@height\z@ \@width\hsize%
1007      \vfill\ject%
1008      \def\mdf@reserved@a{\mdf@put@frame@ii}%
1009    }%
1010  \fi%
1011 }%
1012 \mdf@reserved@a%
1013 }

```

`\mdf@put@frame@ii`

Output of the middle and last box.

```

1014 \def\mdf@put@frame@ii{%Ausgabe der mittleren Box(en) wenn vorhanden
1015   \setlength{\mdf@freevspace@length}{\vsize}%
1016   \setlength{\dimen@}{\dimexpr\ht\mdf@splitbox@one+\dp\mdf@splitbox@one\relax}%
1017   \mdf@dolist{\mdf@advance@length@freevspace@add}{%used \dimen@
1018     outerlinewidth,middlelinewidth,innerlinewidth,%
1019     innerbottommargin}%%Addition der Linien unten
1020   \ifbool{mdf@bottomline}{}%
1021     \advance\dimen@i by \mdf@innerlinewidth@length%
1022     \advance\dimen@i by \mdf@middlelinewidth@length%
1023     \advance\dimen@i by \mdf@outerlinewidth@length%
1024     \relax}%
1025   \ifdimgreater{\dimen@}{\mdf@freevspace@length}%
1026     {%
1027     \advance\mdf@freevspace@length by -\mdf@splitbottomskip@length\relax%
1028     \ifbool{mdf@bottomline}{}%
1029       \advance\dimen@i by -\mdf@innerlinewidth@length%
1030       \advance\dimen@i by -\mdf@middlelinewidth@length%
1031       \advance\dimen@i by -\mdf@outerlinewidth@length%
1032     \relax}%
1033     \splitmaxdepth\z@ \splittopskip\mdf@splittopskip@length%
1034     \mdf@ignorevbadness%
1035     \setbox\mdf@splitbox@two\vsplit\mdf@splitbox@one to \mdf@freevspace@length%
1036     \setbox\mdf@splitbox@two\vbox{\unvbox\mdf@splitbox@two}%PRUEFEN!!!
1037     \setbox\mdf@splitbox@one\vbox{\unvbox\mdf@splitbox@one}%PRUEFEN!!!!
1038     \ifbool{mdf@repeatframetitle}{%
1039       \setbox\mdf@splitbox@one\vbox{%
1040         \vbox to \mdf@splittopskip@length{\hsize\z@}
1041         %\par\unskip\nointerlineskip
1042         \unvcopy\mdf@frametitlebox%
1043         \mdf@@frametitle%
1044         \vbox to\dimexpr
1045           -\mdf@splittopskip@length+\ht\strutbox+\dp\strutbox
1046           +\mdf@innertopmargin@length\relax{\hsize\z@}%
1047         \unvbox\mdf@splitbox@one}%

```

```

1048         }{}%
1049     \ifvoid\mdf@splitbox@one\relax%
1050         \mdf@PackageWarning{You got a bad break\MessageBreak
1051             because the split box is empty\MessageBreak
1052             You have to change the settings}%
1053     \setbox\mdf@splitbox@one{\unvbox\mdf@splitbox@two}%
1054     \def\mdf@reserved@a{\enlargethispage{\baselineskip}\mdf@put@frame@ii}%
1055 \else
1056     \begingroup
1057     \mdf@@setzref
1058     \mdf@putbox@middle%
1059 \endgroup
1060 \hrule \@height\z@ \@width\hsize
1061 \vfill\ject
1062 \def\mdf@reserved@a{\mdf@put@frame@ii}%
1063 \fi
1064 }%Hier die Ausgabe der mittleren Box
1065 {\ifvoid\mdf@splitbox@one
1066     \mdf@PackageWarning{You got a bad break\MessageBreak
1067         because the last split box is empty\MessageBreak
1068         You have to change the settings}%
1069     \setbox\mdf@splitbox@one\vbox{\unvbox\mdf@splitbox@one\hrule \@height\z@ \@width\mdfbounding
1070 \fi%
1071 \ifdimless{\ht\mdf@splitbox@one}{\lsp}}{%
1072     \mdf@PackageWarning{You got a bad break\MessageBreak
1073         because the last split box is empty\MessageBreak
1074         You have to change the settings}%
1075     %\hbext@\z@{\box\mdf@splitbox@one}%
1076     \let\mdf@reserved@a\relax%
1077     \setbox\mdf@splitbox@one\vbox{\unvbox\mdf@splitbox@one\hrule \@height\z@ \@width\mdfboundin
1078 }{}%
1079 \begingroup%
1080     \mdf@@setzref
1081     \mdf@putbox@second%
1082     \hrule \@height\z@ \@width\hsize%
1083 \endgroup%
1084 \let\mdf@reserved@a\relax%
1085 }%Hier kommt die Ausgabe der letzten Box
1086 \mdf@reserved@a%
1087 }
1088

```

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

mdframed.dtx 312 2012-01-08 12:43:36Z marco

```

1127         and (bool {mdf@leftline}) and not (bool {mdf@rightline}}})
1128 \newrobustcmd*{\mdf@test@lr{%
1129     \ifboolexpr{not (bool {mdf@topline}) and not (bool {mdf@bottomline})
1130         and (bool {mdf@leftline}) and (bool {mdf@rightline}}})
1131 \newrobustcmd*{\mdf@test@tb{%
1132     \ifboolexpr{ (bool {mdf@topline}) and (bool {mdf@bottomline})
1133         and not (bool {mdf@leftline}) and not (bool {mdf@rightline}}})
1134 %Einzellinien
1135 \newrobustcmd*{\mdf@test@l{%
1136     \ifboolexpr{ not (bool {mdf@topline}) and not (bool {mdf@bottomline})
1137         and (bool {mdf@leftline}) and not (bool {mdf@rightline}}})
1138 \newrobustcmd*{\mdf@test@r{%
1139     \ifboolexpr{ not (bool {mdf@topline}) and not (bool {mdf@bottomline})
1140         and not (bool {mdf@leftline}) and (bool {mdf@rightline}}})
1141 \newrobustcmd*{\mdf@test@t{%
1142     \ifboolexpr{ (bool {mdf@topline}) and not (bool {mdf@bottomline})
1143         and not (bool {mdf@leftline}) and not (bool {mdf@rightline}}})
1144 \newrobustcmd*{\mdf@test@b{%
1145     \ifboolexpr{ not (bool {mdf@topline}) and (bool {mdf@bottomline})
1146         and not (bool {mdf@leftline}) and not (bool {mdf@rightline}}})
1147 %keine Linien
1148 \newrobustcmd*{\mdf@test@noline{%
1149     \ifboolexpr{ not (bool {mdf@topline}) and not (bool {mdf@bottomline})
1150         and not (bool {mdf@leftline}) and not (bool {mdf@rightline}}})
1151 \newrobustcmd*{\mdf@test@single{%
1152     \ifboolexpr{ not (test {\mdf@test@ltrb} or test {\mdf@test@ltr} or
1153         test {\mdf@test@ltb} or test {\mdf@test@trb} or
1154         test {\mdf@test@lrb} or test {\mdf@test@lb} or
1155         test {\mdf@test@rb} or test {\mdf@test@tr} or
1156         test {\mdf@test@lt} ) }}
1157 %
1158 \DisableKeyvalOption[action=warning,package=mdframed]{mdf}{framemethod}%
1159 \DisableKeyvalOption[action=warning,package=mdframed]{mdf}{xcolor}%
1160
1161 \endinput

```

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

```

1162 %% Style file for mdframed for package option 'framemethod=default'
1163 %%
1164 %% This package may be distributed under the terms of the LaTeX Project
1165 %% Public License, as described in lppl.txt in the base LaTeX distribution.
1166 %% Either version 1.0 or, at your option, any later version.
1167
1168 %%$Id: mdframed.dtx 312 2012-01-08 12:43:36Z marco $
1169 %

```

```

\mdframed0packagename
\mdf@frame0date@svn

```

local settings

```

1170 \def\mdframed0packagename{md-frame-0}
1171 \def\mdf@frame0date@svn$1: #2 #3 #4-#5-#6 #7 #8${#4/#5/#6\space }
1172 \ProvidesFile{md-frame-0.mdf}%
1173     [\mdf@frame0date@svn$Id: mdframed.dtx 312 2012-01-08 12:43:36Z marco $

```

```
1174 \mdversion: \mdframed0packagename]
```

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

short command

```
1175 \def\mdf@background@default{\color{\mdf@backgroundcolor}}
1176 \def\mdf@frametitlebackground@default{\color{\mdf@frametitlebackgroundcolor}}
1177 \def\mdf@innerlinecolor@default{\color{\mdf@innerlinecolor}}
1178 \def\mdf@middlelinecolor@default{\color{\mdf@middlelinecolor}}
1179 \def\mdf@outerlinecolor@default{\color{\mdf@outerlinecolor}}
1180 \def\mdf@frametitlerulecolor@default{\color{\mdf@frametitlerulecolor}}
1181 \let\mdf@linecolor@default\mdf@middlelinecolor@default
1182 \def\mdf@@frametitlerule{%
1183   \ifbool{mdf@frametitlerule}{%
1184     \vbox to \mdf@frametitlerulewidth@length {\hsize\mdfframetitleboxwidth%
1185       \par\unskip\vskip\mdf@frametitlebelowskip@length%
1186       \rlap{\noindent\hspace*{-\mdf@innerleftmargin@length}%
1187         \mdf@frametitlerulecolor@default%
1188         \rule{\dimexpr\mdfframetitleboxwidth%
1189           +\mdf@innerleftmargin@length
1190           +\mdf@innerrightmargin@length\relax
1191           }{\mdf@frametitlerulewidth@length}%
1192       }}%
1193   }{}
1194   \par\unskip\vskip\mdf@innertopmargin@length%
1195 }%
1196
```

```
\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*

```
1197 \def\mdf@frame@background@single{%
1198   \rlap{\mdf@background@default%
1199     \rule[-\mdfboundingboxdepth]{%
1200       {\mdfboundingboxtotalwidth}%
1201       {\mdfboundingboxtotalheight}%
1202     }%
1203 }%
1204 \def\mdf@frame@frametitlebackground@single{%
1205   \rlap{\mdf@frametitlebackground@default%
1206     \rule[\dimexpr-\mdfboundingboxdepth+\mdfboundingboxtotalheight-\mdfframetitleboxtotalheight\relax]{%
1207       {\mdfboundingboxtotalwidth}%
1208       {\mdfframetitleboxtotalheight}%
1209     }%
1210 }%
1211
1212 \def\mdf@frame@topline@single{%
1213   \rlap{\mdf@linecolor@default%
```

```

1214     \ifbool{mdf@topline}{%
1215         \rule[\dimexpr\mdfboundingboxheight-\mdfboundingboxdepth%
1216             +\mdf@innerbottommargin@length+\mdf@innertopmargin@length\relax]%
1217             {\mdfboundingboxtotalwidth}%
1218             {\mdf@middlelinewidth@length}}%
1219     }%
1220 }%
1221 }%
1222 \def\mdf@frame@bottomline@single{%
1223     \rlap{\ifbool{mdf@leftline}{\hspace*{-\mdf@middlelinewidth@length}}{\mdf@linecolor@default%
1224         \ifbool{mdf@bottomline}{%
1225             \rule[\dimexpr-\mdfboundingboxdepth-\mdf@middlelinewidth@length\relax]%
1226                 {\dimexpr\mdfboundingboxtotalwidth
1227                     \ifbool{mdf@rightline}{+\mdf@middlelinewidth@length}{}%
1228                     \ifbool{mdf@leftline}{+\mdf@middlelinewidth@length}{\relax}%
1229                     {\mdf@middlelinewidth@length}}%
1230                 }%
1231             }%
1232         }%
1233     \def\mdf@frame@leftline@single{%
1234         \llap{\mdf@linecolor@default%
1235             \rule[-\mdfboundingboxdepth]%
1236                 {\mdf@middlelinewidth@length}%
1237                 {\dimexpr\mdfboundingboxtotalheight%
1238                     \ifbool{mdf@topline}{+\mdf@middlelinewidth@length}{\relax}%
1239                 }%
1240             }%
1241     \def\mdf@frame@rightline@single{%
1242         \rlap{\mdf@linecolor@default%
1243             \hspace*{\mdfboundingboxwidth}%
1244             \hspace*{\mdf@innerrightmargin@length}%
1245             \rule[\dimexpr-\mdfboundingboxdepth%
1246                 \relax]%
1247                 {\mdf@middlelinewidth@length}%
1248                 {\dimexpr\mdfboundingboxtotalheight%
1249                     +\ifbool{mdf@topline}{\mdf@middlelinewidth@length}{0pt}\relax}%
1250             }%
1251         }%
1252     \def\mdf@putbox@single{%%%% Ausgabe der ungesplitteten Gesamtbox
1253         \ifvoid\mdf@splitbox@one
1254         \else%
1255             \mdf@makebox@out{%
1256                 \mdf@makeboxalign@left%
1257                 \setlength{\mdfboundingboxwidth}%
1258                     {\wd\mdf@splitbox@one}%
1259                 \setlength{\mdfboundingboxtotalwidth}%
1260                     {\dimexpr\mdfboundingboxwidth+\mdf@innerleftmargin@length%
1261                         +\mdf@innerrightmargin@length\relax}%
1262                 \setlength{\mdfboundingboxheight}%
1263                     {\dimexpr\ht\mdf@splitbox@one+\dp\mdf@splitbox@one\relax}%
1264                 \setlength{\mdfboundingboxdepth}%
1265                     {\dimexpr\dp\mdf@splitbox@one+\mdf@innerbottommargin@length\relax}%
1266                 \setlength{\mdfboundingboxtotalheight}%
1267                     {\dimexpr\mdfboundingboxheight+\mdf@innertopmargin@length%
1268                         +\mdf@innerbottommargin@length\relax}%
1269                 \setlength{\mdftotallinewidth}{%

```

```

1270          \dimexpr\mdf@innerlinewidth@length+\mdf@middlelinewidth@length%
1271          +\mdf@outerlinewidth@length}%
1272      \noindent%
1273      \setlength{\@tempdima}{\dimexpr\mdfboundingboxtotalwidth%
1274          +\ifbool{mdf@leftline}%
1275              {\mdf@middlelinewidth@length}{\z@}%
1276          +\ifbool{mdf@rightline}%
1277              {\mdf@middlelinewidth@length}{\z@}\relax}%
1278      \mdf@makebox@in[\@tempdima]{%
1279          \null%
1280          \ifbool{mdf@leftline}{%
1281              \hspace*{\mdftotalllinewidth}%
1282              \mdf@frame@leftline@single%
1283              }{}%
1284          \mdf@frame@topline@single%
1285          \mdf@frame@bottomline@single%
1286          \mdf@frame@background@single%
1287          \ifdefempty{\mdf@frametitle}{\mdf@frame@frametitlebackground@single}%
1288          \hspace*{\mdf@innerleftmargin@length}%
1289          \ifbool{mdf@rightline}{%
1290              \mdf@frame@rightline@single%
1291              }{}%
1292          {\box\mdf@splitbox@one}%
1293      }%
1294      \mdf@makeboxalign@right%
1295  }%
1296  \fi%
1297 }

```

```

\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`

```

1298 \def\mdf@frame@background@first{%
1299     \rlap{\mdf@background@default%
1300         \rule[-\mdfboundingboxdepth]{%
1301             {\mdfboundingboxtotalwidth}%
1302             {\mdfboundingboxtotalheight}%
1303         }%
1304     }%
1305 \def\mdf@frame@frametitlebackground@first{%
1306     \ifdimless{\mdfframetitleboxtotalheight}{\mdfboundingboxtotalheight}%
1307     {%
1308         \rlap{\mdf@frametitlebackground@default%
1309             \rule[\dimexpr-\mdfboundingboxdepth+\mdfboundingboxtotalheight-\mdfframetitleboxtotalheight\relax]{%
1310                 {\mdfboundingboxtotalwidth}%
1311                 {\mdfframetitleboxtotalheight}%
1312             }%
1313         \global\mdfframetitleboxtotalheight=-\p@ \relax%
1314     }{\mdf@PackageWarning{You got a page break inside the frame title\MessageBreak
1315         Current this isn't well supported}%
1316         \rlap{\mdf@frametitlebackground@default%

```



```

1317     \rule[-\mdfboundingboxdepth]%
1318         {\mdfboundingboxtotalwidth}%
1319         {\mdfboundingboxtotalheight}%
1320     }%
1321     \global\mdfframetitleboxtotalheight=\dimexpr\mdfframetitleboxtotalheight
1322         -\mdfboundingboxheight
1323         +\mdf@frametitlebelowskip@length
1324         +.5\baselineskip-1pt
1325     %
1326         +\dp\strutbox
1327     \relax%
1328 }%
1329 \def\mdf@frame@leftline@first{%
1330     \llap{\mdf@linecolor@default%
1331         \rule[-\mdfboundingboxdepth]%
1332             {\mdf@middlelinewidth@length}%
1333             {\dimexpr\mdfboundingboxtotalheight%
1334                 +\ifbool{mdf@topline}{\mdf@middlelinewidth@length}{0pt}}\relax}%
1335     }%
1336 }%
1337 \def\mdf@frame@topline@first{%
1338     \rlap{\mdf@linecolor@default%
1339         \rule[\dimexpr\mdfboundingboxheight-\mdfboundingboxdepth+%
1340             \mdf@splitbottomskip@length+\mdf@innertopmargin@length\relax]%
1341             {\mdfboundingboxtotalwidth}%
1342             {\mdf@middlelinewidth@length}%
1343         }%
1344     }
1345 \def\mdf@frame@rightline@first{%
1346     \rlap{\mdf@linecolor@default\hspace*{\mdfboundingboxwidth}%
1347         \hspace*{\mdf@innerrightmargin@length}%
1348         \rule[-\mdfboundingboxdepth]%
1349             {\mdf@middlelinewidth@length}%
1350             {\dimexpr\mdfboundingboxtotalheight%
1351                 +\ifbool{mdf@topline}{\mdf@middlelinewidth@length}{0pt}}\relax}%
1352     }%
1353 }%
1354 \def\mdf@putbox@first{%%% Ausgabe der Teilbox 1
1355     \ifvoid\mdf@splitbox@two
1356     \else%
1357         \mdf@makebox@out[\linewidth]{%
1358             \mdf@makeboxalign@left%
1359             \setlength{\mdfboundingboxwidth}{\wd\mdf@splitbox@two}%
1360             \setlength{\mdfboundingboxtotalwidth}%
1361                 {\dimexpr\mdfboundingboxwidth+\mdf@innerleftmargin@length%
1362                     +\mdf@innerrightmargin@length\relax}%
1363             \setlength{\mdfboundingboxheight}{\dimexpr\ht\mdf@splitbox@two+\dp\mdf@splitbox@two\relax}%
1364             \setlength{\mdfboundingboxdepth}%
1365                 {\dimexpr\dp\mdf@splitbox@two+\mdf@splitbottomskip@length\relax}%
1366             \setlength{\mdfboundingboxtotalheight}%
1367                 {\dimexpr\mdfboundingboxheight+\mdf@innertopmargin@length%
1368                     +\mdf@splitbottomskip@length\relax}%
1369             \setlength{\@tempdima}%
1370                 {\dimexpr\mdfboundingboxtotalwidth%
1371                     +\ifbool{mdf@leftline}{\mdf@middlelinewidth@length}{\z@}%
1372                     +\ifbool{mdf@rightline}{\mdf@middlelinewidth@length}{\z@}%

```

```

1373         \relax}%
1374     \mdf@makebox@in[\@tempdima]{%
1375         \null%
1376         \ifbool{mdf@leftline}{%
1377             \hspace*{\mdf@middlelinewidth@length}%
1378             \mdf@frame@leftline@first}}}%
1379         \ifbool{mdf@topline}{%
1380             \mdf@frame@topline@first}}}%
1381         \mdf@frame@background@first%
1382         \ifdefempty{\mdf@frametitle}{\mdf@frame@frametitlebackground@first}%
1383         \hspace*{\mdf@innerleftmargin@length}%
1384         \ifbool{mdf@rightline}{%
1385             \mdf@frame@rightline@first}}}%
1386         {\box\mdf@splitbox@two}%
1387     }%
1388     \mdf@makebox@align@right%
1389 }%
1390 \fi%
1391 }

```

```

\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

```

1392 \def\mdf@frame@background@second{%
1393     \rlap{\mdf@background@default%
1394         \rule[-\mdf@boundingboxdepth]{%
1395             {\mdf@boundingboxtotalwidth}%
1396             {\mdf@boundingboxtotalheight}}%
1397     }%
1398 }%
1399 \def\mdf@frame@frametitlebackground@second{%
1400     \ifdimless{\mdfframetitleboxtotalheight}{\z@}%
1401     {%
1402         \rlap{\mdf@frametitlebackground@default%
1403             \rule[\dimexpr-\mdf@boundingboxdepth+\mdf@boundingboxtotalheight-\mdfframetitleboxtotalheight\relax]{%
1404                 {\mdf@boundingboxtotalwidth}%
1405                 {\mdfframetitleboxtotalheight}}%
1406         }%
1407     }%
1408 }%
1409 \def\mdf@frame@leftline@second{%
1410     \llap{\mdf@linecolor@default%
1411         \rule[-\mdf@boundingboxdepth]{%
1412             {\mdf@middlelinewidth@length}%
1413             {\dimexpr\mdf@boundingboxtotalheight}}%
1414     }%
1415 }%
1416 \def\mdf@frame@bottomline@second{%
1417     \rlap{\ifbool{mdf@leftline}{\hspace*{-\mdf@middlelinewidth@length}}{\mdf@linecolor@default%
1418         \rule[\dimexpr-\mdf@boundingboxdepth-\mdf@middlelinewidth@length\relax]{%
1419             {\dimexpr\mdf@boundingboxtotalwidth

```

```

1420             \ifbool{mdf@rightline}{+\mdf@middlelinewidth@length}{}
1421             \ifbool{mdf@leftline}{+\mdf@middlelinewidth@length}{}\relax}%
1422         {\mdf@middlelinewidth@length}%
1423     }%
1424 }%
1425 \def\mdf@frame@rightline@second{%
1426     \rlap{\mdf@linecolor@default\hspace*{\mdfboundingboxwidth}%
1427         \hspace*{\mdf@innerrightmargin@length}%
1428         \rule[-\mdfboundingboxdepth]%
1429             {\mdf@middlelinewidth@length}%
1430             {\mdfboundingboxtotalheight}%
1431         }%
1432     }%
1433 \def\mdf@putbox@second{%
1434     \ifvoid\mdf@splitbox@one%
1435     \else
1436         \mdf@makebox@out{%
1437             \mdf@makeboxalign@left%
1438             \setlength{\mdfboundingboxwidth}{\wd\mdf@splitbox@one}%
1439             \setlength{\mdfboundingboxtotalwidth}%
1440                 {\dimexpr\mdfboundingboxwidth+\mdf@innerleftmargin@length%
1441                     +\mdf@innerrightmargin@length\relax}%
1442             \setlength{\mdfboundingboxheight}{\dimexpr\ht\mdf@splitbox@one+\dp\mdf@splitbox@one\relax}%
1443             \setlength{\mdfboundingboxdepth}%
1444                 {\dimexpr\dp\mdf@splitbox@one+\mdf@innerbottommargin@length\relax}%
1445             \setlength{\mdfboundingboxtotalheight}%
1446                 {\dimexpr\mdfboundingboxheight+\mdf@innerbottommargin@length\relax}%
1447             \setlength{\@tempdima}{\dimexpr\mdfboundingboxtotalwidth%
1448                 +\ifbool{mdf@leftline}{\mdf@middlelinewidth@length}{\z@}%
1449                 +\ifbool{mdf@rightline}{\mdf@middlelinewidth@length}{\z@}%
1450                 \relax}%
1451             \mdf@makebox@in[\@tempdima]{%
1452                 \null%
1453                 \ifbool{mdf@leftline}{%
1454                     \hspace*{\mdf@middlelinewidth@length}%
1455                     \mdf@frame@leftline@second}{}%
1456                 \ifbool{mdf@bottomline}{%
1457                     \mdf@frame@bottomline@second}{}%
1458                 \mdf@frame@background@second%
1459                 \ifdefempty{\mdf@frametitle}{\mdf@frame@frametitlebackground@second}%
1460                 \hspace*{\mdf@innerleftmargin@length}%
1461                 \ifbool{mdf@rightline}{%
1462                     \mdf@frame@rightline@second}{}%
1463                 {\box\mdf@splitbox@one}%
1464             }%
1465             \mdf@makeboxalign@right%
1466         }%
1467     \fi
1468 }%

```

```

\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

```

1469 \def\mdf@frame@leftline@middle{%
1470   \llap{\mdf@linecolor@default%
1471     \rule[-\mdfboundingboxdepth]%
1472       {\mdf@middlelinewidth@length}%
1473       {\mdfboundingboxtotalheight}%
1474   }%
1475 }%
1476 \def\mdf@frame@background@middle{%
1477   \rlap{\mdf@background@default%
1478     \rule[-\mdfboundingboxdepth]%
1479       {\mdfboundingboxtotalwidth}%
1480       {\mdfboundingboxtotalheight}%
1481   }%
1482 }%
1483 \def\mdf@frame@frametitlebackground@middle{%
1484   \ifdimless{\mdfframetitleboxtotalheight}{\z@}%
1485     {}%
1486   {\rlap{\mdf@frametitlebackground@default%
1487     \rule[\dimexpr-\mdfboundingboxdepth+\mdfboundingboxtotalheight-\mdfframetitleboxtotalheight\relax]
1488       {\mdfboundingboxtotalwidth}%
1489       {\mdfframetitleboxtotalheight}%
1490     }%
1491     \global\mdfframetitleboxtotalheight=-\p@relax%
1492   }%
1493 }%
1494 \def\mdf@frame@rightline@middle{%
1495   \rlap{\mdf@linecolor@default\hspace*{\mdfboundingboxwidth}%
1496     \hspace*{\mdf@innerrightmargin@length}%
1497     \rule[-\mdfboundingboxdepth]%
1498       {\mdf@middlelinewidth@length}%
1499       {\mdfboundingboxtotalheight}%
1500   }%
1501 }%
1502 \def\mdf@putbox@middle{%
1503   \ifvoid\mdf@splitbox@two%
1504   \else
1505     \mdf@makebox@out{%
1506       \mdf@makeboxalign@left%
1507       \setlength{\mdfboundingboxwidth}{\wd\mdf@splitbox@two}%
1508       \setlength{\mdfboundingboxtotalwidth}%
1509         {\dimexpr\mdfboundingboxwidth+\mdf@innerleftmargin@length%
1510           +\mdf@innerrightmargin@length\relax}%
1511       \setlength{\mdfboundingboxheight}{\dimexpr\ht\mdf@splitbox@two+\dp\mdf@splitbox@two\relax}%
1512       \setlength{\mdfboundingboxdepth}%
1513         {\dimexpr\dp\mdf@splitbox@two+\mdf@splitbottomskip@length\relax}%
1514       \setlength{\mdfboundingboxtotalheight}%
1515         {\dimexpr\mdfboundingboxheight+\mdf@splitbottomskip@length\relax}%
1516       \setlength{\@tempdima}{\dimexpr\mdfboundingboxtotalwidth%
1517         +\ifbool{\mdf@leftline}{\mdf@middlelinewidth@length}{\z@}%
1518         +\ifbool{\mdf@rightline}{\mdf@middlelinewidth@length}{\z@}%
1519       \relax}%
1520       \mdf@makebox@in[\@tempdima]{%
1521         \null%
1522         \ifbool{\mdf@leftline}{%
1523           \hspace*{\mdf@middlelinewidth@length}%

```

```

1524         \mdf@frame@leftline@middle}{}%
1525         \mdf@frame@background@middle%
1526         \ifdefempty{\mdf@frametitle}{\mdf@frame@frametitlebackground@middle}%
1527         \hspace*{\mdf@innerleftmargin@length}%
1528         \ifbool{mdf@rightline}{%
1529             \mdf@frame@rightline@middle}{}%
1530         {\box\mdf@splitbox@two}%
1531     }%
1532     \mdf@makeboxalign@right%
1533 }
1534 \fi%
1535 }

1536 \endinput

```

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

```

1537 %% Style file for mdframed for package option 'framemethod=default'
1538 %%
1539 %% This package may be distributed under the terms of the LaTeX Project
1540 %% Public License, as described in lppl.txt in the base LaTeX distribution.
1541 %% Either version 1.0 or, at your option, any later version.
1542
1543 %%$Id: mdframed.dtx 312 2012-01-08 12:43:36Z marco $
1544 %

```

```

\mdframedIpackagename
\mdf@frameIdate@svn

```

local settings

```

1545 \def\mdframedIpackagename{md-frame-1}
1546 \def\mdf@frameIdate@svn$#1: #2 #3 #4-#5-#6 #7 #8$#{#4/#5/#6\space }
1547 \ProvidesFile{md-frame-1.mdf}%
1548         [\mdf@frameIdate@svn$Id: mdframed.dtx 312 2012-01-08 12:43:36Z marco $ %
1549         \mdversion: \mdframedIpackagename]
1550 %

```

```
\mdf@tikz@settings
```

Define settings for tikz

```

1551 %Allgemeine Einstellungen fuer tikz
1552 \def\mdf@tikz@settings{%
1553 %
1554     \tikzset{mdfbox/.style={anchor=south west,%
1555                             inner sep=0pt,%
1556                             outer sep=0pt,%
1557                             \mdf@fontcolor,}}% anchor der Ausgabebox ist unten links
1558     \tikzset{mdfcorners/.style={rounded corners=\mdf@roundcorner@length}}%
1559     \tikzset{mdfbackground/.style={fill=\mdf@backgroundcolor,%
1560                                     draw=\mdf@backgroundcolor}}%
1561     \tikzset{mdfframetitlebackground/.style={fill=\mdf@frametitlebackgroundcolor,%
1562                                                draw=none,%
1563                                                rounded corners={max(\mdf@roundcorner@length%
1564                                                                -\mdf@innerlinewidth@length%
1565                                                                -.5\mdf@middlelinewidth@length,0)}}}%

```

```

1566 %
1567 \tikzset{mdfouterline/.style={}}%
1568 % nur wenn outerlinewidth>0 wird aussere Linie gezeichnet
1569 \ifdimgreater{\mdf@outerlinewidth@length}{\z@}
1570   {\tikzset{mdfouterline/.append style={%
1571     draw=\mdf@outerlinecolor,%
1572     line width=2\mdf@outerlinewidth@length+\mdf@middlelinewidth@length}}}%
1573 %
1574 \tikzset{mdfinnerline/.style={}}%
1575 % nur wenn innerlinewidth>0 wird innere Linie gezeichnet
1576 \ifdimgreater{\mdf@innerlinewidth@length}{\z@}
1577   {\tikzset{mdfinnerline/.append style={%
1578     draw=\mdf@innerlinecolor,%
1579     line width=2\mdf@innerlinewidth@length+\mdf@middlelinewidth@length}}}%
1580 %
1581 \mdf@tikzset@local
1582 \tikzset{mdfmiddleline/.style={}}%
1583 % nur wenn middlelinewidth>0 wird mittlere Linie gezeichnet
1584 \ifdimgreater{\mdf@middlelinewidth@length}{\z@}
1585   {\tikzset{mdfmiddleline/.append style={%
1586     preaction={draw=\mdf@middlelinecolor,%
1587       line width=\mdf@middlelinewidth@length},%
1588     line width=\mdf@middlelinewidth@length,%
1589     tikzsetting}}}%
1590   }{}%
1591 }%

```

```

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

```

Befehle fuer Ausgabe von Rahmen und Hintergrund

```

1592 \newrobustcmd*\mdf@tikzbox@tfl[1]{%three or four borders
1593   \clip(0,0)rectangle(\mdfboundingboxwidth,\mdfboundingboxheight);%
1594   \begin{scope}[mdfcorners]%
1595     \clip[preaction=mdfouterline]%
1596       [postaction=mdfbackground]%
1597       [postaction=mdfinnerline]#1;%
1598   \end{scope}%
1599   \path[mdfmiddleline,mdfcorners]#1;
1600 }%
1601
1602
1603
1604 \newrobustcmd*\mdf@tikzbox@otl[2]{%one or two borders
1605   \clip(0,0)rectangle(\mdfboundingboxwidth,\mdfboundingboxheight);%
1606   \begin{scope}
1607     \path[mdfouterline,mdfcorners]#1;%
1608     \clip[postaction=mdfbackground]#2;%
1609     \path[mdfinnerline,mdfcorners]#1;%
1610   \end{scope}%
1611   \path[mdfmiddleline,mdfcorners]#1;%

```

```
\mdf@put@frametitlerule
```

frametitlerule with tikz

```

1612 \tikzset{mdfframetitrerule/.style={%
1613     draw=none,
1614     fill=\mdf@frametitrerulecolor,
1615 }%
1616 }
1617 \def\mdf@@frametitrerule{%
1618     \ifbool{mdf@frametitrerule}{%
1619         \vbox{\hsize0pt
1620             \par\unskip\vskip\mdf@frametitlebelowskip@length
1621             \noindent\rlap{\hspace*{-\mdf@innerleftmargin@length}%
1622             \begingroup%
1623             \pgfmathsetlength{\dimen@}{\mdfframetitleboxwidth+\mdf@innerleftmargin@length+\mdf@innerrightmargin@length}%
1624             \tikz\draw[mdfframetitrerule] (0,0)%
1625                 rectangle (\dimen@,\mdf@frametitrerulewidth@length);
1626             \endgroup}
1627         }%
1628     }{}
1629     \par\unskip\vskip\mdf@innertopmargin@length%
1630 }%
1631

```

`\mdf@putbox@single`

Output of the non breakable contents.

```

1632 % Info zu den verwendeten Punkten:
1633 % O ist die untere linke Ecke der Mitte der middleline
1634 % P ist die obere rechte Ecke der Mitte der middleline
1635 % A ist der Punkt fuer den anchor (d.h. die untere linke Ecke) der Ausgabebox
1636 %
1637 \def\mdf@putbox@single{%
1638     \ifvoid\mdf@splitbox@one
1639     \else%
1640         \mdf@makebox@out{%
1641             \mdf@makeboxalign@left%
1642             \mdf@tikz@settings%
1643 %
1644             \setlength\mdfboundingboxwidth{\wd\mdf@splitbox@one}%
1645             \advance\mdfboundingboxwidth by \mdf@innerleftmargin@length\relax%
1646             \advance\mdfboundingboxwidth by \mdf@innerrightmargin@length\relax%
1647             \ifbool{mdf@leftline}{%
1648                 \advance\mdfboundingboxwidth by \mdf@innerlinewidth@length\relax%
1649                 \advance\mdfboundingboxwidth by \mdf@middlelinewidth@length\relax%
1650                 \advance\mdfboundingboxwidth by \mdf@outerlinewidth@length\relax}%{}%
1651             \ifbool{mdf@rightline}{%
1652                 \advance\mdfboundingboxwidth by \mdf@innerlinewidth@length\relax%
1653                 \advance\mdfboundingboxwidth by \mdf@middlelinewidth@length\relax%
1654                 \advance\mdfboundingboxwidth by \mdf@outerlinewidth@length\relax}%{}%
1655 %
1656             \setlength\mdfboundingboxheight{\dimexpr\ht\mdf@splitbox@one+\dp\mdf@splitbox@one\relax}%
1657             \advance\mdfboundingboxheight by \mdf@innertopmargin@length\relax%
1658             \advance\mdfboundingboxheight by \mdf@innerbottommargin@length\relax%
1659             \ifbool{mdf@topline}{%
1660                 \advance\mdfboundingboxheight by \mdf@innerlinewidth@length\relax%
1661                 \advance\mdfboundingboxheight by \mdf@middlelinewidth@length\relax%
1662                 \advance\mdfboundingboxheight by \mdf@outerlinewidth@length\relax}%{}%

```

```

1663 \ifbool{mdf@bottomline}{%
1664   \advance\mdfboundingboxheight by \mdf@innerlinewidth@length\relax%
1665   \advance\mdfboundingboxheight by \mdf@middlelinewidth@length\relax%
1666   \advance\mdfboundingboxheight by \mdf@outerlinewidth@length\relax}}{%
1667 \mdf@makebox@in[\mdfboundingboxwidth]{%
1668 \null%
1669 \begin{tikzpicture}[remember picture]%
1670 \begin{scope}
1671   \pgfmathsetlengthmacro\mdf@Ax{+\mdf@innerleftmargin@length}%
1672   \pgfmathsetlengthmacro\mdf@Ay{+\mdf@innerbottommargin@length}%
1673   \pgfmathsetlengthmacro\mdf@Ox{+0pt}%
1674   \pgfmathsetlengthmacro\mdf@Oy{+0pt}%
1675   \pgfmathsetlengthmacro\mdf@Px{+\mdfboundingboxwidth}%
1676   \pgfmathsetlengthmacro\mdf@Py{+\mdfboundingboxheight}%
1677   \ifbool{mdf@leftline}{%
1678     {%
1679       \pgfmathsetlengthmacro\mdf@Ax%
1680         {\mdf@Ax+\mdf@outerlinewidth@length+
1681          \mdf@middlelinewidth@length+\mdf@innerlinewidth@length}%
1682       \pgfmathsetlengthmacro\mdf@Ox%
1683         {\mdf@Ox+\mdf@outerlinewidth@length+0.5\mdf@middlelinewidth@length}%
1684     }{%
1685 \ifbool{mdf@rightline}{%
1686   {%
1687     \pgfmathsetlengthmacro\mdf@Px%
1688       {\mdf@Px-\mdf@outerlinewidth@length-0.5\mdf@middlelinewidth@length}%
1689   }{%
1690 \ifbool{mdf@bottomline}{%
1691   {%
1692     \pgfmathsetlengthmacro\mdf@Ay%
1693       {\mdf@Ay+\mdf@outerlinewidth@length+\mdf@middlelinewidth@length
1694        +\mdf@innerlinewidth@length}%
1695     \pgfmathsetlengthmacro\mdf@Oy%
1696       {\mdf@Oy+\mdf@outerlinewidth@length+0.5\mdf@middlelinewidth@length}%
1697   }{%
1698 \ifbool{mdf@topline}{%
1699   {%
1700     \pgfmathsetlengthmacro\mdf@Py%
1701       {\mdf@Py-\mdf@outerlinewidth@length-0.5\mdf@middlelinewidth@length}%
1702   }{%
1703 %
1704 \coordinate(0)at(\mdf@Ox,\mdf@Oy);%
1705 \coordinate(P)at(\mdf@Px,\mdf@Py);%
1706 %
1707 \mdf@test@ltrb{\mdf@tikzbox@tfl{(0)--(0|-P)--(P)--(P|-0)--cycle)}}{%
1708 %
1709 \mdf@test@ltb{\mdf@tikzbox@tfl{(P|-0)--(0)--(0|-P)--(P)}}{%
1710 \mdf@test@trb{\mdf@tikzbox@tfl{(0|-P)--(P)--(P|-0)--(0)}}{%
1711 \mdf@test@ltr{\mdf@tikzbox@tfl{(0)--(0|-P)--(P)--(P|-0)}}{%
1712 \mdf@test@lrb{\mdf@tikzbox@tfl{(P|-0)--(0)--(0|-P)--(P)}}{%
1713 %
1714 \mdf@test@lb{\mdf@tikzbox@otl{(P|-0)--(0)--(0|-P)}}%
1715   {(P)--(P|-0)[mdfcorners]--(0)--(0|-P)}%
1716   }{%
1717 \mdf@test@rb{\mdf@tikzbox@otl{(P)--(P|-0)--(0)}}%
1718   {(0|-P)--(P)[mdfcorners]--(P|-0)--(0)}%

```



```

1719         }{}%
1720     \mdf@test@tr{\mdf@tikzbox@otl{(0|P)--(P)--(P|0)}%
1721                 {(0)--(0|P)[mdfcorners]--(P)--(P|0)}%
1722         }{}%
1723     \mdf@test@lt{\mdf@tikzbox@otl{(0)--(0|P)--(P)}%
1724                 {(P|0)--(0)[mdfcorners]--(0|P)--(P)}%
1725         }{}%
1726     \mdf@test@lr{\mdf@tikzbox@otl{(0)--(0|P)(P)--(P|0)}%
1727                 {(0)rectangle(P)}%
1728         }{}%
1729     \mdf@test@tb{\mdf@tikzbox@otl{(0)--(0|P)(0|P)--(P)}%
1730                 {(0)rectangle(P)}%
1731         }{}%
1732 %
1733     \mdf@test@l{\mdf@tikzbox@otl{(0)--(0|P)}%
1734                 {(0)rectangle(P)}%
1735         }{}%
1736     \mdf@test@r{\mdf@tikzbox@otl{(0|P)--(P)}%
1737                 {(0)rectangle(P)}%
1738         }{}%
1739     \mdf@test@t{\mdf@tikzbox@otl{(0|P)--(P)}%
1740                 {(0)rectangle(P)}%
1741         }{}%
1742     \mdf@test@b{\mdf@tikzbox@otl{(0)--(0|P)}%
1743                 {(0)rectangle(P)}%
1744         }{}%
1745 %
1746     \mdf@test@noline{\path[mdfbackground,mdfcorners](0)rectangle(P);}%
1747 %
1748     %Frametitlebackground
1749     \drawbackgroundframetitle@single
1750 %
1751     \node[mdfbox]at(\mdf@Ax,\mdf@Ay){\box\mdf@splitbox@one};% Ausgabebox einfuegen
1752 \end{scope}
1753 %HIER KOMMT EIN WEITERES MAKRO
1754 \mdfcreateextratikz
1755 \end{tikzpicture}%
1756 }%
1757 \mdf@makeboxalign@right%
1758 }%
1759 \fi
1760 }%
1761 \def\drawbackgroundframetitle@single{%
1762 \ifdefempty{\mdf@frametitle}{}{}%
1763 \drawbackgroundframetitle@@single%
1764 }%
1765 }%
1766 \def\drawbackgroundframetitle@@single{%
1767 \begin{scope}%background frame title
1768 \ifbool{mdf@leftline}{
1769 \pgfmathsetlengthmacro\mdf@0x%
1770 {\mdf@0x+\mdf@innerlinewidth@length+0.5\mdf@middlelinewidth@length}
1771 }{}%
1772 \ifbool{mdf@rightline}{%
1773 \pgfmathsetlengthmacro\mdf@Px%
1774 {\mdf@Px-\mdf@innerlinewidth@length-0.5\mdf@middlelinewidth@length}

```

```

1775     }{}%
1776     \ifbool{mdf@topline}{%
1777         \pgfmathsetlengthmacro\mdf@Py%
1778             {\mdf@Py-\mdf@innerlinewidth@length-0.5\mdf@middlelinewidth@length}
1779     }{}%
1780     \pgfmathsetlengthmacro\mdf@Fy
1781         {\mdf@Py-\mdfframetitleboxtotalheight}
1782     \path[mdfframetitlebackground]
1783         (\mdf@0x,\mdf@Fy) -- (\mdf@0x,\mdf@Py)%
1784         --(\mdf@Px,\mdf@Py) --(\mdf@Px,\mdf@Fy);
1785     \end{scope}
1786 }

```

`\mdf@putbox@first`

Output of the first breakable contents.

```

1787 \def\drawbrackgroundframetitle@first{%
1788     \ifdefempty{\mdf@frametitle}{}{}%
1789     \ifdimgreater{\mdf@boundingboxheight}{\mdfframetitleboxtotalheight}%
1790     {%
1791         \drawbrackgroundframetitle@@first
1792         \pgfmathsetlength{\global\mdfframetitleboxtotalheight}{-\p@}%
1793     }{\mdf@PackageWarning{You got a page break inside the frame title\MessageBreak
1794         Currently this isn't well supported}%
1795     \drawbrackgroundframetitle@@first
1796     \pgfmathsetlength{\global\mdfframetitleboxtotalheight}%
1797         {\mdfframetitleboxtotalheight-\mdf@boundingboxheight-
1798             \mdf@innerlinewidth@length-0.5\mdf@middlelinewidth@length%
1799             +\mdf@frametitlebelowskip@length+\mdf@splitbottomskip@length+\mdf@splittopskip@length}
1800             +\dp\strutbox%
1801         }%
1802     }%
1803 }%
1804 }%
1805 %
1806 \def\drawbrackgroundframetitle@@first{%
1807     \begin{scope}%background frame title
1808         \ifbool{mdf@leftline}{%
1809             \pgfmathsetlengthmacro\mdf@0x%
1810                 {\mdf@0x+\mdf@innerlinewidth@length+0.5\mdf@middlelinewidth@length}
1811             }{}%
1812         \ifbool{mdf@rightline}{%
1813             \pgfmathsetlengthmacro\mdf@Px%
1814                 {\mdf@Px-\mdf@innerlinewidth@length-0.5\mdf@middlelinewidth@length}
1815             }{}%
1816         \ifbool{mdf@topline}{%
1817             \pgfmathsetlengthmacro\mdf@Py%
1818                 {\mdf@Py-\mdf@innerlinewidth@length-0.5\mdf@middlelinewidth@length}
1819             }{}%
1820         \pgfmathsetlengthmacro\mdf@Fy
1821             {\max(0,\mdf@Py-\mdfframetitleboxtotalheight)}
1822         \path[mdfframetitlebackground]
1823             (\mdf@0x,\mdf@Fy) -- (\mdf@0x,\mdf@Py)%
1824             --(\mdf@Px,\mdf@Py) --(\mdf@Px,\mdf@Fy);
1825     \end{scope}%

```

```

1826 }%
1827 %
1828 \def\mdf@putbox@first{%
1829   \ifvoid\mdf@splitbox@two
1830   \else%
1831     \mdf@makebox@out{%
1832       \mdf@makeboxalign@left%
1833       \mdf@tikz@settings%
1834       \setlength\mdfboundingboxwidth{\wd\mdf@splitbox@two}%
1835       \advance\mdfboundingboxwidth by \mdf@innerleftmargin@length\relax%
1836       \advance\mdfboundingboxwidth by \mdf@innerrightmargin@length\relax%
1837       \ifbool{mdf@leftline}{%
1838         \advance\mdfboundingboxwidth by \mdf@innerlinewidth@length\relax%
1839         \advance\mdfboundingboxwidth by \mdf@middlelinewidth@length\relax%
1840         \advance\mdfboundingboxwidth by \mdf@outerlinewidth@length\relax}}{%
1841       \ifbool{mdf@rightline}{%
1842         \advance\mdfboundingboxwidth by \mdf@innerlinewidth@length\relax%
1843         \advance\mdfboundingboxwidth by \mdf@middlelinewidth@length\relax%
1844         \advance\mdfboundingboxwidth by \mdf@outerlinewidth@length\relax}}}%
1845 %
1846 \setlength\mdfboundingboxheight{\dimexpr\ht\mdf@splitbox@two+\dp\mdf@splitbox@two\relax}%
1847 \advance\mdfboundingboxheight by \mdf@innertopmargin@length\relax%
1848 \advance\mdfboundingboxheight by \mdf@splitbottomskip@length\relax%
1849 \ifbool{mdf@topline}{%
1850   \advance\mdfboundingboxheight by \mdf@innerlinewidth@length\relax%
1851   \advance\mdfboundingboxheight by \mdf@middlelinewidth@length\relax%
1852   \advance\mdfboundingboxheight by \mdf@outerlinewidth@length\relax}}}%
1853 %
1854 %\ifdimequal{\pagegoal}{\maxdimen}{\enlargethispage{\baselineskip}}}% ???
1855 \ifdimgreater{\pagegoal-\maxdimen}{0pt}{\enlargethispage{\baselineskip}}%
1856 \mdf@makebox@in[\mdfboundingboxwidth]{%
1857   \null%
1858   \begin{tikzpicture}[remember picture]
1859     \begin{scope}
1860 %
1861     \pgfmathsetlengthmacro\mdf@Ax{+\mdf@innerleftmargin@length}%
1862     \pgfmathsetlengthmacro\mdf@Ay{+\mdf@splitbottomskip@length}%
1863     \pgfmathsetlengthmacro\mdf@Ox{+0pt}%
1864     \pgfmathsetlengthmacro\mdf@Oy{+0pt}%
1865     \pgfmathsetlengthmacro\mdf@Px{+\mdfboundingboxwidth}%
1866     \pgfmathsetlengthmacro\mdf@Py{+\mdfboundingboxheight}%
1867     \ifbool{mdf@leftline}
1868     {%
1869       \pgfmathsetlengthmacro\mdf@Ax%
1870         {\mdf@Ax+\mdf@outerlinewidth@length+
1871          \mdf@middlelinewidth@length+\mdf@innerlinewidth@length}%
1872       \pgfmathsetlengthmacro\mdf@Ox%
1873         {\mdf@Ox+\mdf@outerlinewidth@length+0.5\mdf@middlelinewidth@length}%
1874     }{%
1875       \ifbool{mdf@rightline}{%
1876         \pgfmathsetlengthmacro\mdf@Px%
1877           {\mdf@Px-\mdf@outerlinewidth@length-0.5\mdf@middlelinewidth@length}%
1878       }{%
1879         \ifbool{mdf@topline}{%
1880           \pgfmathsetlengthmacro\mdf@Py%
1881             {\mdf@Py-\mdf@outerlinewidth@length-0.5\mdf@middlelinewidth@length}%

```

```

1882     }{}%
1883 %
1884     \coordinate(0)at(\mdf@0x,\mdf@0y);%
1885     \coordinate(P)at(\mdf@Px,\mdf@Py);%
1886 %
1887     \ifboolexpr{test {\mdf@test@lrb} or test {\mdf@test@ltr}}%
1888         {\mdf@tikzbox@otl{(0)--(0|-P)--(P)--(P|-0)}}%
1889         {}%
1890     \ifboolexpr{test {\mdf@test@ltb} or test {\mdf@test@lt}}%
1891         {\mdf@tikzbox@otl{(0)--(0|-P)--(P)}{(P|-0)--(0)[mdfcorners]--(0|-P)--(P)}}%
1892         {}%
1893     \ifboolexpr{test {\mdf@test@trb} or test {\mdf@test@tr}}%
1894         {\mdf@tikzbox@otl{(0|-P)--(P)--(P|-0)}{(0)--(0|-P)[mdfcorners]--(P)--(P|-0)}}%
1895         {}%
1896     \ifboolexpr{test {\mdf@test@lrb} or test {\mdf@test@lr}}%
1897         {\mdf@tikzbox@otl{(0)--(0|-P)(P)--(P|-0)}{(0)rectangle(P)}}%
1898         {}%
1899     \ifboolexpr{test {\mdf@test@tb} or test {\mdf@test@t}}%
1900         {\mdf@tikzbox@otl{(0|-P)--(P)}{(0)rectangle(P)}}%
1901         {}%
1902     \ifboolexpr{test {\mdf@test@lb} or test {\mdf@test@l}}%
1903         {\mdf@tikzbox@otl{(0)--(0|-P)}{(0)rectangle(P)}}%
1904         {}%
1905     \ifboolexpr{test {\mdf@test@rb} or test {\mdf@test@r}}%
1906         {\mdf@tikzbox@otl{(0|-P)--(P)}{(0)rectangle(P)}}%
1907         {}%
1908     \mdf@test@b{\path[mdfbackground](0)rectangle(P);}%
1909 %
1910     \mdf@test@online{\path[mdfbackground,mdfcorners](0)--(0|-P)--(P)--(P|-0);}%
1911 %
1912     \drawbackgroundframetitle@first
1913 %
1914     \node[mdfbox]at(\mdf@Ax,\mdf@Ay){\box\mdf@splitbox@two};% Ausgabebox einfuegen
1915     \end{scope}
1916     %HIER KOMMT EIN WEITERES MAKRO
1917     \mdfcreateextratikz%
1918     \end{tikzpicture}%
1919     }%
1920     \mdf@makeboxalign@right%
1921     }%
1922 \fi
1923 }%

```

\mdf@putbox@middle

Output of the middle breakable contents.

```

1924 \def\drawbackgroundframetitle@middle{%
1925     \ifdefempty{\mdf@frametitle}{}{}%
1926     \ifdimless{\mdfframetitleboxtotalheight}{\z@}
1927     {}{}%
1928     \drawbackgroundframetitle@@middle%
1929     \pgfmathsetlength{\global\mdfframetitleboxtotalheight}{-\p@}%
1930     }%
1931     }%
1932 }%

```

```

1933 %
1934 \def\drawbackgroundframetitle@@middle{%
1935     \begin{scope}%background frame title
1936     \ifbool{mdf@leftline}{
1937         \pgfmathsetlengthmacro\mdf@0x%
1938             {\mdf@0x+\mdf@innerlinewidth@length+0.5\mdf@middlelinewidth@length}
1939     }{}%
1940     \ifbool{mdf@rightline}{%
1941         \pgfmathsetlengthmacro\mdf@Px%
1942             {\mdf@Px-\mdf@innerlinewidth@length-0.5\mdf@middlelinewidth@length}
1943     }{}%
1944     \pgfmathsetlengthmacro\mdf@Fy
1945         {\mdf@Py-\mdfframetitleboxtotalheight}
1946     \path[mdfframetitlebackground,rounded corners=\z@]
1947         (\mdf@0x,\mdf@Fy) -- (\mdf@0x,\mdf@Py)%
1948         -- (\mdf@Px,\mdf@Py) -- (\mdf@Px,\mdf@Fy);
1949     \end{scope}
1950 }%
1951 %
1952 \def\mdf@putbox@middle{%
1953     \ifvoid\mdf@splitbox@two
1954     \else%
1955         \mdf@makebox@out{%
1956             \mdf@makeboxalign@left%
1957             \mdf@tikz@settings%
1958 %
1959             \setlength\mdfboundingboxwidth{\wd\mdf@splitbox@two}%
1960             \advance\mdfboundingboxwidth by \mdf@innerleftmargin@length\relax%
1961             \advance\mdfboundingboxwidth by \mdf@innerrightmargin@length\relax%
1962             \ifbool{mdf@leftline}{%
1963                 \advance\mdfboundingboxwidth by \mdf@innerlinewidth@length\relax%
1964                 \advance\mdfboundingboxwidth by \mdf@middlelinewidth@length\relax%
1965                 \advance\mdfboundingboxwidth by \mdf@outerlinewidth@length\relax}%{}%
1966             \ifbool{mdf@rightline}{%
1967                 \advance\mdfboundingboxwidth by \mdf@innerlinewidth@length\relax%
1968                 \advance\mdfboundingboxwidth by \mdf@middlelinewidth@length\relax%
1969                 \advance\mdfboundingboxwidth by \mdf@outerlinewidth@length\relax}%{}%
1970 %
1971             \setlength\mdfboundingboxheight{\dimexpr\ht\mdf@splitbox@two+\dp\mdf@splitbox@two\relax}%
1972             \advance\mdfboundingboxheight by \mdf@splitbottomskip@length\relax%
1973 %
1974             \mdf@makebox@in[\mdfboundingboxwidth]{%
1975                 \null%
1976                 \begin{tikzpicture}[remember picture]
1977                     \begin{scope}
1978                         \pgfmathsetlengthmacro\mdf@Ax{+\mdf@innerleftmargin@length}%
1979                         \pgfmathsetlengthmacro\mdf@Ay{+\mdf@splitbottomskip@length}%
1980                         \pgfmathsetlengthmacro\mdf@0x{+0pt}%
1981                         \pgfmathsetlengthmacro\mdf@0y{+0pt}%
1982                         \pgfmathsetlengthmacro\mdf@Px{+\mdfboundingboxwidth}%
1983                         \pgfmathsetlengthmacro\mdf@Py{+\mdfboundingboxheight}%
1984                         \ifbool{mdf@leftline}%
1985                             {%
1986                                 \pgfmathsetlengthmacro\mdf@Ax%
1987                                     {\mdf@Ax+\mdf@outerlinewidth@length+%
1988                                         \mdf@middlelinewidth@length+\mdf@innerlinewidth@length}%

```

```

1989      \pgfmathsetlengthmacro\mdf@0x%
1990      {\mdf@0x+\mdf@outerlinewidth@length+0.5\mdf@middlelinewidth@length}%
1991      }{}%
1992      \ifbool{mdf@rightline}%
1993      {%
1994      \pgfmathsetlengthmacro\mdf@Px%
1995      {\mdf@Px-\mdf@outerlinewidth@length-0.5\mdf@middlelinewidth@length}%
1996      }{}%
1997 %
1998      \coordinate(0)at(\mdf@0x,\mdf@0y);%
1999      \coordinate(P)at(\mdf@Px,\mdf@Py);%
2000 %
2001      \ifboolexpr{bool {mdf@leftline} and bool {mdf@rightline}}%
2002      {\mdf@tikzbox@otl{(0)--(0|-P)(P)--(P|-0)}{(0)rectangle(P)}}{}%
2003      \ifboolexpr{bool {mdf@leftline} and not (bool {mdf@rightline})}%
2004      {\mdf@tikzbox@otl{(0)--(0|-P)}{(0)rectangle(P)}}{}%
2005      \ifboolexpr{not (bool {mdf@leftline}) and bool {mdf@rightline}}%
2006      {\mdf@tikzbox@otl{(P)--(P|-0)}{(0)rectangle(P)}}{}%
2007      \ifboolexpr{not (bool {mdf@leftline}) and not (bool {mdf@rightline})}%
2008      {\path[mdfbackground](0)rectangle(P);}{}%
2009 %
2010      \drawbrackgroundframetitle@middle
2011 %
2012      \node[mdfbox]at(\mdf@Ax,\mdf@Ay){\box\mdf@splitbox@two};% Ausgabebox einfuegen
2013      \end{scope}
2014      %HIER KOMMT EIN WEITERES MAKRO
2015      \end{tikzpicture}%
2016      }%
2017      \mdf@makeboxalign@right%
2018      }%
2019      \fi
2020      }%

```

\mdf@putbox@second

Output of the last breakable contents.

```

2021 \def\drawbrackgroundframetitle@second{%
2022 \ifdefempty{\mdf@frametitle}{}{}%
2023 \ifdimless{\mdfframetitleboxtotalheight}{\z@}
2024 {}{}%
2025 \drawbrackgroundframetitle@@second%
2026 }%
2027 }%
2028 }%
2029 %
2030 \def\drawbrackgroundframetitle@@second{%
2031 \begin{scope}%background frame title
2032 \ifbool{mdf@leftline}{
2033 \pgfmathsetlengthmacro\mdf@0x%
2034 {\mdf@0x+\mdf@innerlinewidth@length+0.5\mdf@middlelinewidth@length}
2035 }{}%
2036 \ifbool{mdf@rightline}{%
2037 \pgfmathsetlengthmacro\mdf@Px%
2038 {\mdf@Px-\mdf@innerlinewidth@length-0.5\mdf@middlelinewidth@length}
2039 }{}%

```

```

2040      \pgfmathsetlengthmacro\mdf@Fy
2041          {\mdf@Py-\mdfframetitleboxtotalheight}
2042      \path[mdfframetitlebackground,rounded corners=\z@]
2043          (\mdf@Ox,\mdf@Fy) -- (\mdf@Ox,\mdf@Py)%
2044          --(\mdf@Px,\mdf@Py) --(\mdf@Px,\mdf@Fy);
2045      \end{scope}
2046 }%
2047 \def\mdf@putbox@second{%
2048     \ifvoid\mdf@splitbox@one
2049     \else%
2050         \mdf@makebox@out{%
2051             \mdf@makeboxalign@left%
2052             \mdf@tikz@settings%
2053 %
2054             \setlength\mdfboundingboxwidth{\wd\mdf@splitbox@one}%
2055             \advance\mdfboundingboxwidth by \mdf@innerleftmargin@length\relax%
2056             \advance\mdfboundingboxwidth by \mdf@innerrightmargin@length\relax%
2057             \ifbool{mdf@leftline}{%
2058                 \advance\mdfboundingboxwidth by \mdf@innerlinewidth@length\relax%
2059                 \advance\mdfboundingboxwidth by \mdf@middlelinewidth@length\relax%
2060                 \advance\mdfboundingboxwidth by \mdf@outerlinewidth@length\relax}}{%
2061             \ifbool{mdf@rightline}{%
2062                 \advance\mdfboundingboxwidth by \mdf@innerlinewidth@length\relax%
2063                 \advance\mdfboundingboxwidth by \mdf@middlelinewidth@length\relax%
2064                 \advance\mdfboundingboxwidth by \mdf@outerlinewidth@length\relax}}}%
2065 %
2066             \setlength\mdfboundingboxheight{\dimexpr\ht\mdf@splitbox@one+\dp\mdf@splitbox@one\relax}%
2067             \advance\mdfboundingboxheight by \mdf@innerbottommargin@length\relax%
2068             \ifbool{mdf@bottomline}{%
2069                 \advance\mdfboundingboxheight by \mdf@innerlinewidth@length\relax%
2070                 \advance\mdfboundingboxheight by \mdf@middlelinewidth@length\relax%
2071                 \advance\mdfboundingboxheight by \mdf@outerlinewidth@length\relax}}}%
2072 %
2073             \mdf@makebox@in[\mdfboundingboxwidth]{%
2074                 \null%
2075                 \begin{tikzpicture}[remember picture]
2076                     \begin{scope}
2077                         \pgfmathsetlengthmacro\mdf@Ax{+\mdf@innerleftmargin@length}%
2078                         \pgfmathsetlengthmacro\mdf@Ay{+\mdf@innerbottommargin@length}%
2079                         \pgfmathsetlengthmacro\mdf@Ox{+0pt}%
2080                         \pgfmathsetlengthmacro\mdf@Oy{+0pt}%
2081                         \pgfmathsetlengthmacro\mdf@Px{+\mdfboundingboxwidth}%
2082                         \pgfmathsetlengthmacro\mdf@Py{+\mdfboundingboxheight}%
2083                         \ifbool{mdf@leftline}%
2084                         {%
2085                             \pgfmathsetlengthmacro\mdf@Ax%
2086                                 {\mdf@Ax+\mdf@outerlinewidth@length+
2087                                 \mdf@middlelinewidth@length+\mdf@innerlinewidth@length}%
2088                             \pgfmathsetlengthmacro\mdf@Ox%
2089                                 {\mdf@Ox+\mdf@outerlinewidth@length+0.5\mdf@middlelinewidth@length}%
2090                         }{}%
2091                         \ifbool{mdf@rightline}%
2092                         {%
2093                             \pgfmathsetlengthmacro\mdf@Px%
2094                                 {\mdf@Px-\mdf@outerlinewidth@length-0.5\mdf@middlelinewidth@length}%
2095                         }{}%

```



```

2096 \ifbool{mdf@bottomline}%
2097 {%
2098 \pgfmathsetlengthmacro\mdf@Ay%
2099 {\mdf@Ay+\mdf@outerlinewidth@length+
2100 \mdf@middlelinewidth@length+\mdf@innerlinewidth@length}%
2101 \pgfmathsetlengthmacro\mdf@Oy%
2102 {\mdf@Oy+\mdf@outerlinewidth@length+0.5\mdf@middlelinewidth@length}%
2103 }{}%
2104 %
2105 \coordinate(0)at(\mdf@0x,\mdf@0y);%
2106 \coordinate(P)at(\mdf@Px,\mdf@Py);%
2107 %
2108 \ifboolexpr{test {\mdf@test@ltrb} or test {\mdf@test@lrb}}%
2109 {\mdf@tikzbox@otfl{(P|-0)--(0)--(0|-P)--(P))}%
2110 }{}%
2111 \ifboolexpr{test {\mdf@test@ltb} or test {\mdf@test@lb}}%
2112 {\mdf@tikzbox@otl{(P|-0)--(0)--(0|-P)){(P)--(P|-0)[mdfcorners]--(0)--(0|-P))}%
2113 }{}%
2114 \ifboolexpr{test {\mdf@test@trb} or test {\mdf@test@rb}}%
2115 {\mdf@tikzbox@otl{(P)--(P|-0)--(0)){(0|-P)--(P)[mdfcorners]--(P|-0)--(0))}%
2116 }{}%
2117 \ifboolexpr{test {\mdf@test@ltr} or test {\mdf@test@lr}}%
2118 {\mdf@tikzbox@otl{(0)--(0|-P)(P)--(P|-0)){(0)rectangle(P))}%
2119 }{}%
2120 \ifboolexpr{test {\mdf@test@tb} or test {\mdf@test@b}}%
2121 {\mdf@tikzbox@otl{(0)--(0|-P)){(0)rectangle(P))}%
2122 }{}%
2123 \ifboolexpr{test {\mdf@test@lt} or test {\mdf@test@l}}%
2124 {\mdf@tikzbox@otl{(0)--(0|-P)){(0)rectangle(P))}%
2125 }{}%
2126 \ifboolexpr{test {\mdf@test@tr} or test {\mdf@test@r}}%
2127 {\mdf@tikzbox@otl{(0|-P)--(P)){(0)rectangle(P))}%
2128 }{}%
2129 \mdf@test@t{\path[mdfbackground,mdfcorners](0|-P)--(0)--(0|-P)--(P);}%
2130 %
2131 \mdf@test@noline{\path[mdfbackground,mdfcorners](0|-P)--(0)--(0|-P)--(P);}%
2132 %
2133 \drawbrackgroundframetitle@second
2134 %
2135 \node[mdfbox] at (\mdf@Ax,\mdf@Ay){\box\mdf@splitbox@one};% Ausgabebox einfuegen
2136 \end{scope}
2137 %HIER KOMMT EIN WEITERES MAKRO
2138 \end{tikzpicture}%
2139 }%
2140 \mdf@makeboxalign@right%
2141 }%
2142 \fi
2143 }%

2144 \endinput

```

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

```

2145 %% Style file for mdframed for package option 'framemethod=default'
2146 %%
2147 %% This package may be distributed under the terms of the LaTeX Project

```



```

2148 %% Public License, as described in lppl.txt in the base LaTeX distribution.
2149 %% Either version 1.0 or, at your option, any later version.
2150
2151 %%$Id: mdframed.dtx 312 2012-01-08 12:43:36Z marco $
2152 %

```

```

\mdframedIIPackagename
\mdf@frameIIDate@svn

```

local settings

```

2153 \def\mdframedIIPackagename{md-frame-2}
2154 \def\mdf@frameIIDate@svn$#1: #2 #3 #4-#5-#6 #7 #8${#4/#5/#6\space }
2155 \ProvidesFile{md-frame-2.mdf}%
2156      [\mdf@frameIIDate@svn$Id: mdframed.dtx 312 2012-01-08 12:43:36Z marco $ %
2157      \mdversion: \mdframedIIPackagename]

```

```

\mdf@ptlength@to@pscode
\ptTps

```

Command to calculate a latex length to postscript

```

2158 \def\mdf@ptlength@to@pscode#1{\pst@number{#1} \pst@number\psxunit div }
2159 \def\mdf@ptlength@to@pscode@length#1{\pst@number{\csname mdf@#1@length\endcsname} \pst@number\psxunit o
2160 \let\ptTps\mdf@ptlength@to@pscode\relax
2161 \let\ptTpsL\mdf@ptlength@to@pscode@length\relax

```

```

\mdfbackgroundstyle
\mdflinestyle
\mdfframetitlestyle
\mdfframetitlebackground

```

background and line settings for pstricks

```

2162 \def\mdfpstricks@settings{%expand by \addtopsstyle
2163   \newpsstyle{mdfbackgroundstyle}%
2164     {linecolor=\mdf@backgroundcolor,fillstyle=solid,%
2165     fillcolor=\mdf@backgroundcolor,linestyle=none,%
2166     ,dimen=middle,%
2167     }%
2168 %
2169   \newpsstyle{mdfframetitlebackgroundstyle}{%
2170     linecolor=\mdf@frametitlebackgroundcolor,
2171     fillcolor=\mdf@frametitlebackgroundcolor,
2172     fillstyle=solid,linestyle=none,
2173     linearc=\ifdimgreater{\mdf@roundcorner@length%
2174               -\mdf@innerlinewidth@length%
2175               -.5\mdf@middlelinewidth@length}
2176     {\z@}{\dimexpr\mdf@roundcorner@length%
2177               -\mdf@innerlinewidth@length%
2178               -.5\mdf@middlelinewidth@length}{\z@},
2179   }
2180 %
2181   \newpsstyle{mdfouterlinestyle}{linestyle=none}%
2182   \ifdimgreater{\mdf@outerlinewidth@length}{\z@}
2183     {\newpsstyle{mdfouterlinestyle}{%
2184       linecolor=\mdf@outerlinecolor,%
2185       linewidth=\dimexpr2\mdf@outerlinewidth@length+\mdf@middlelinewidth@length\relax,

```

```

2186     dimen=middle,
2187     }}{}%
2188 %
2189 \newpsstyle{mdfinnerlinestyle}{linestyle=none}%
2190 \ifdimgreater{\mdf@innerlinewidth@length}{\z@}%
2191     {\newpsstyle{mdfinnerlinestyle}{%
2192         linecolor=\mdf@innerlinecolor,%
2193         linewidth=\dimexpr2\mdf@innerlinewidth@length+\mdf@middlelinewidth@length\relax,
2194         dimen=middle,
2195         }}{}%
2196 %
2197 \newpsstyle{mdfmiddlelinestyle}{linestyle=none}%
2198 \ifdimgreater{\mdf@middlelinewidth@length}{\z@}%
2199     {\newpsstyle{mdfmiddlelinestyle}{%
2200         linewidth=\mdf@middlelinewidth@length,%
2201         linecolor=\mdf@middlelinecolor,dimen=middle
2202         }}{}%
2203 \mdfpstricks@appendsettings
2204 }%
2205 %
2206 \newrobustcmd*{\mdf@pstricksbox@fl[2]}{%four lines
2207     \psframe[style=mdfouterlinestyle](#1)(#2)%aussen=3mm
2208     \psframe[style=mdfbackgroundstyle](#1)(#2)%Hintergrund
2209     \psclip{\psframe[style=mdfmiddlelinestyle](#1)(#2)}
2210     \psframe[style=mdfinnerlinestyle](#1)(#2)%innere=3mm
2211     \endpsclip
2212     \psframe[style=mdfmiddlelinestyle](#1)(#2)%mittlere=2mm
2213     }%
2214 \newrobustcmd*{\mdf@pstricksbox@tl[1]}{%three lines
2215     \psline[style=mdfouterlinestyle]#1%aussen=3mm
2216     \psline[style=mdfbackgroundstyle]#1%Hintergrund
2217     \psclip{\psline[style=mdfmiddlelinestyle]#1}
2218     \psline[style=mdfinnerlinestyle]#1%innere=3mm
2219     \endpsclip
2220     \psline[style=mdfmiddlelinestyle]#1%mittlere=2mm
2221     }%
2222 \newrobustcmd*{\mdf@pstricksbox@tcl[2]}{%two combined lines
2223 %>#1 background comple
2224 %>#2 line path
2225     \psline[style=mdfouterlinestyle]#2%aussen=3mm
2226     \psline[style=mdfbackgroundstyle]#2%Hintergrund
2227     \psclip{\pscustom[linestyle=none]{
2228         \psline[style=mdfmiddlelinestyle]#2
2229         \psline[linestyle=none,lineararc=0pt]#1}
2230     }
2231     \psframe[style=mdfbackgroundstyle,lineararc=0pt](mdf@0)(mdf@P)%Hintergrund
2232     \psline[style=mdfinnerlinestyle]#2%innere=3mm
2233     \endpsclip
2234     \psline[style=mdfmiddlelinestyle]#2%mittlere=2mm
2235     }%
2236 \newrobustcmd*{\mdf@pstricksbox@tncl[2]}{%two not combined lines
2237 \beginngroup
2238     \psset{lineararc=0pt}
2239     \psline[style=mdfouterlinestyle](mdf@0)#1%aussen=3mm
2240     \psline[style=mdfouterlinestyle](mdf@P)#2%aussen=3mm
2241     \psclip{

```

```

2242 \pscustom[linestyle=none]{%
2243   \psline[style=mdfmiddlelinestyle](mdf@0)#1%mittlere=2mm
2244   \psline[linestyle=none](mdf@0)#2
2245   \psline[style=mdfmiddlelinestyle](mdf@P)#2%mittlere=2mm
2246   \psline[linestyle=none](mdf@P)#1
2247 }%
2248 }%
2249 \psframe[style=mdfbackgroundstyle,lineararc=0pt](mdf@0)(mdf@P)%Hintergrund
2250 \psline[style=mdfinnerlinestyle](mdf@0)#1%innere=3mm
2251 \psline[style=mdfinnerlinestyle](mdf@P)#2%innere=3mm
2252 \endpsclip
2253 \psline[style=mdfmiddlelinestyle](mdf@0)#1%mittlere=2mm
2254 \psline[style=mdfmiddlelinestyle](mdf@P)#2%mittlere=2mm
2255 \endgroup
2256 }%
2257 \newrobustcmd*\mdf@pstricksbox@ol[1]{%one line
2258 \begingroup
2259 \psset{lineararc=0pt}
2260 \psline[style=mdfouterlinestyle]#1%ausen=3mm
2261 \psline[style=mdfbackgroundstyle]#1%Hintergrund
2262 \psclip{\pscustom[linestyle=none]{
2263   \psline[style=mdfmiddlelinestyle]#1
2264   \psframe[linestyle=none,fillstyle=none,dimen=inner](mdf@0)(mdf@P)
2265 }}
2266 \psframe[style=mdfbackgroundstyle](mdf@0)(mdf@P)
2267 \psline[style=mdfinnerlinestyle]#1%innere=3mm
2268 \endpsclip
2269 \psline[style=mdfmiddlelinestyle]#1%mittlere=2mm
2270 \endgroup%
2271 }%
2272
2273 %
2274 \newpsstyle{mdfframetitlerule}{%
2275   linecolor=\mdf@frametitlerulecolor,%
2276   fillcolor=\mdf@frametitlerulecolor,%
2277   fillstyle=solid,dimen=outer,%
2278 }
2279 %

```

`\mdf@put@frametitlerule`

frametitlerule with pstricks

```

2280 \def\mdf@@frametitlerule{%
2281 \ifbool{mdf@frametitlerule}{%
2282 \vbox{\hsize0pt
2283 \par\unskip\vskip\mdf@frametitlebelowskip@length
2284 \noindent\rlap{%
2285 \begingroup%
2286 \begin{pspicture}(0,0)(0,\mdf@frametitlerulewidth@length)
2287 \psframe[style=mdfframetitlerule](!\ptTpsL{innerleftmargin} neg 0)%
2288 \psframe[style=mdfframetitlerule](!\ptTpsL{innerrightmargin}
2289 \ptTpsL{mdfframetitleboxwidth} add \ptTpsL{frametitlerulewidth})
2290 \end{pspicture}
2291 \endgroup}
2292 }%

```

```

2293 }{}
2294 \par\unskip\vskip\mdf@innertopmargin@length%
2295 }%
2296 %
2297 % \begin{macro}{mdf@putbox@single}
2298 % Single output
2299 % \begin{macrocode}
2300 % Info zu den verwendeten Punkten:
2301 % O ist die untere linke Ecke der Mitte der middleline
2302 % P ist die obere rechte Ecke der Mitte der middleline
2303 % A ist der Punkt fuer den anchor (d.h. die untere linke Ecke) der Ausgabebox
2304 \def\mdf@putbox@single{%
2305   \ifvoid\mdf@splitbox@one
2306   \else%
2307     \mdf@makebox@out{%
2308       \mdf@makeboxalign@left%
2309       \setlength\mdfboundingboxwidth{\wd\mdf@splitbox@one}%
2310       \advance\mdfboundingboxwidth by \mdf@innerleftmargin@length\relax%
2311       \advance\mdfboundingboxwidth by \mdf@innerrightmargin@length\relax%
2312       \ifbool{mdf@leftline}{%
2313         \advance\mdfboundingboxwidth by \mdf@innerlinewidth@length\relax%
2314         \advance\mdfboundingboxwidth by \mdf@middlelinewidth@length\relax%
2315         \advance\mdfboundingboxwidth by \mdf@outerlinewidth@length\relax}}{%
2316       \ifbool{mdf@rightline}{%
2317         \advance\mdfboundingboxwidth by \mdf@innerlinewidth@length\relax%
2318         \advance\mdfboundingboxwidth by \mdf@middlelinewidth@length\relax%
2319         \advance\mdfboundingboxwidth by \mdf@outerlinewidth@length\relax}}}%
2320 %
2321     \setlength\mdfboundingboxheight{\dimexpr\ht\mdf@splitbox@one+\dp\mdf@splitbox@one\relax}%
2322     \advance\mdfboundingboxheight by \mdf@innerbottommargin@length\relax%
2323     \advance\mdfboundingboxheight by \mdf@innertopmargin@length\relax%
2324     \ifbool{mdf@topline}{%
2325       \advance\mdfboundingboxheight by \mdf@innerlinewidth@length\relax%
2326       \advance\mdfboundingboxheight by \mdf@middlelinewidth@length\relax%
2327       \advance\mdfboundingboxheight by \mdf@outerlinewidth@length\relax}}{%
2328     \ifbool{mdf@bottomline}{%
2329       \advance\mdfboundingboxheight by \mdf@innerlinewidth@length\relax%
2330       \advance\mdfboundingboxheight by \mdf@middlelinewidth@length\relax%
2331       \advance\mdfboundingboxheight by \mdf@outerlinewidth@length\relax}}}%
2332 %
2333     \setlength\mdftotalllinewidth{\dimexpr\mdf@innerlinewidth@length%
2334                                     +\mdf@middlelinewidth@length
2335                                     +\mdf@outerlinewidth@length\relax}%
2336     \psset{unit=1truecm}%
2337     \mdf@makebox@in[\mdfboundingboxwidth]{%
2338       \null%
2339       \begin{pspicture}(0,0)(\mdfboundingboxwidth,\mdfboundingboxheight)
2340         \mdfpstricks@settings%
2341         \psset{lineararc=\mdf@roundcorner@length, cornersize=absolut,}%
2342         \expandafter\psset\expandafter{\mdf@psset@local}%
2343         \pnode(\mdf@innerleftmargin@length,\mdf@innerbottommargin@length){mdf@A}
2344         \pnode(0,0){mdf@O}
2345         \pnode(\mdfboundingboxwidth,\mdfboundingboxheight){mdf@P}
2346         \ifbool{mdf@leftline}{%
2347           {%
2348             \nodexn{(mdf@A)+(\mdf@outerlinewidth@length,0)}

```

```

2349             +(\mdf@middlelinewidth@length,0)
2350             +(\mdf@innerlinewidth@length,0)){mdf@A}%
2351     \nodexn{(mdf@0)+(\mdf@outerlinewidth@length,0)
2352             +0.5(\mdf@middlelinewidth@length,0)){mdf@0}%
2353     }{}%
2354 \ifbool{mdf@rightline}%
2355 {%
2356     \nodexn{(mdf@P) - (\mdf@outerlinewidth@length,0)
2357             -0.5(\mdf@middlelinewidth@length,0)){mdf@P}%
2358     }{}%
2359 \ifbool{mdf@bottomline}%
2360 {%
2361     \nodexn{(mdf@A)+(0,\mdf@outerlinewidth@length)
2362             +(0,\mdf@middlelinewidth@length)
2363             +(0,\mdf@innerlinewidth@length)){mdf@A}%
2364     \nodexn{(mdf@0)+(0,\mdf@outerlinewidth@length)
2365             +0.5(0,\mdf@middlelinewidth@length)){mdf@0}%
2366     }{}%
2367 \ifbool{mdf@topline}%
2368 {%
2369     \nodexn{(mdf@P) - (0,\mdf@outerlinewidth@length)
2370             -0.5(0,\mdf@middlelinewidth@length)){mdf@P}
2371     }{}%
2372 %
2373 %Four lines
2374 \mdf@test@lrb{\mdf@pstricksbox@fl{mdf@0}{mdf@P}}{}
2375 %three lines
2376 \mdf@test@ltb{\mdf@pstricksbox@tl{(mdf@P|mdf@0)(mdf@0)(mdf@0|mdf@P)(mdf@P)}}{}
2377 \mdf@test@trb{\mdf@pstricksbox@tl{(mdf@0)(mdf@P|mdf@0)(mdf@P)(mdf@0|mdf@P)}}{}
2378 \mdf@test@ltr{\mdf@pstricksbox@tl{(mdf@0)(mdf@0|mdf@P)(mdf@P)(mdf@P|mdf@0)}}{}%
2379 \mdf@test@lrb{\mdf@pstricksbox@tl{(mdf@0|mdf@P)(mdf@0)(mdf@P|mdf@0)(mdf@P)}}{}%
2380 %two lines combined
2381 \mdf@test@lb{\mdf@pstricksbox@tcl{(mdf@P|mdf@0)(mdf@P)(mdf@0|mdf@P)}%
2382             {(mdf@0|mdf@P)(mdf@0)(mdf@P|mdf@0)}}{}
2383 \mdf@test@rb{\mdf@pstricksbox@tcl{(mdf@P)(mdf@0|mdf@P)(mdf@0)}%
2384             {(mdf@0)(mdf@P|mdf@0)(mdf@P)}}{}
2385 \mdf@test@tr{\mdf@pstricksbox@tcl{(mdf@P|mdf@0)(mdf@0)(mdf@0|mdf@P)}%
2386             {(mdf@0|mdf@P)(mdf@P)(mdf@P|mdf@0)}}{}
2387 \mdf@test@lt{\mdf@pstricksbox@tcl{(mdf@0)(mdf@P|mdf@0)(mdf@P)}%
2388             {(mdf@0)(mdf@0|mdf@P)(mdf@P)}}{}
2389 %two lines not combined
2390 \mdf@test@lr{\mdf@pstricksbox@tncl{(mdf@0|mdf@P)}{(mdf@P|mdf@0)}
2391             {}}
2392 \mdf@test@tb{\mdf@pstricksbox@tncl{(mdf@P|mdf@0)}{(mdf@0|mdf@P)}
2393             {}}
2394 %single line
2395 \mdf@test@l{\mdf@pstricksbox@ol{(mdf@0)(mdf@0|mdf@P)}}{}
2396 \mdf@test@r{\mdf@pstricksbox@ol{(mdf@P)(mdf@P|mdf@0)}}{}
2397 \mdf@test@t{\mdf@pstricksbox@ol{(mdf@P)(mdf@0|mdf@P)}}{}
2398 \mdf@test@b{\mdf@pstricksbox@ol{(mdf@0)(mdf@P|mdf@0)}}{}
2399 %no line
2400 \mdf@test@noline{\psframe[style=mdfbackgroundstyle](mdf@0)(mdf@P)}{}
2401 %
2402 %Frametitlebackground
2403 \drawbackgroundframetitle@single
2404 %output%

```

```

2405      \rput[bl](mdf@A){\box\mdf@splitbox@one}
2406 %      \psdot(mdf@A)\uput[90](mdf@A){mdf at A}
2407 %      \psdot(mdf@P)\uput[90](mdf@P){mdf at P}
2408 %      \psdot(mdf@O)\uput[90](mdf@O){mdf at O}
2409 %
2410 %      \endpsclip
2411      \end{pspicture}%
2412  }%
2413      \mdf@makeboxalign@right%
2414  }%
2415 \fi
2416 }%
2417 \def\drawbackgroundframetitle@single{%
2418 \ifdefempty{\mdf@frametitle}{\}%
2419 \drawbackgroundframetitle@@single%
2420 }%
2421 }%
2422 \def\drawbackgroundframetitle@@single{%
2423 \begingroup%
2424 \ifbool{mdf@leftline}{%
2425 \nodexn{(mdf@O)+(\mdf@innerlinewidth@length,0)
2426 +0.5(\mdf@middlelinewidth@length,0)}{mdf@O}%
2427 }{}%
2428 \ifbool{mdf@rightline}{%
2429 \nodexn{(mdf@P)-(\mdf@innerlinewidth@length,0)
2430 -0.5(\mdf@middlelinewidth@length,0)}{mdf@P}%
2431 }{}%
2432 \ifbool{mdf@topline}{%
2433 \nodexn{(mdf@P)-(0,\mdf@innerlinewidth@length)
2434 -0.5(0,\mdf@middlelinewidth@length)}{mdf@P}%
2435 }{}%
2436 \nodexn{(mdf@P)-(0,\mdfframetitleboxtotalheight)}{mdf@F}%
2437 \psline[style=mdfframetitlebackgroundstyle](mdf@O|mdf@F)(mdf@O|mdf@P)
2438 (mdf@P)(mdf@P|mdf@F)%
2439 \endgroup
2440 }

```

`\mdf@putbox@first`

First output

```

2441 \def\mdf@putbox@first{%
2442 \ifvoid\mdf@splitbox@two
2443 \else%
2444 \mdf@makebox@out{%
2445 \mdf@makeboxalign@left%
2446 %\ifbool{mdf@leftline}{\hspace*{\mdf@middlelinewidth@length}}{}%
2447 \setlength\mdfboundingboxwidth{\wd\mdf@splitbox@two}%
2448 \advance\mdfboundingboxwidth by \mdf@innerleftmargin@length\relax%
2449 \advance\mdfboundingboxwidth by \mdf@innerrightmargin@length\relax%
2450 \ifbool{mdf@leftline}{%
2451 \advance\mdfboundingboxwidth by \mdf@innerlinewidth@length\relax%
2452 \advance\mdfboundingboxwidth by \mdf@middlelinewidth@length\relax%
2453 \advance\mdfboundingboxwidth by \mdf@outerlinewidth@length\relax}%
2454 \ifbool{mdf@rightline}{%
2455 \advance\mdfboundingboxwidth by \mdf@innerlinewidth@length\relax%

```

```

2456 \advance\mdfboundingboxwidth by \mdf@middlelinewidth@length\relax%
2457 \advance\mdfboundingboxwidth by \mdf@outerlinewidth@length\relax}}}%
2458 \setlength\mdfboundingboxheight{\dimexpr\ht\mdf@splitbox@two+\dp\mdf@splitbox@two\relax}%
2459 \advance\mdfboundingboxheight by \mdf@innertopmargin@length\relax%
2460 \advance\mdfboundingboxheight by \mdf@splitbottomskip@length\relax%
2461 \ifbool{mdf@topline}{%
2462 \advance\mdfboundingboxheight by \mdf@innerlinewidth@length\relax%
2463 \advance\mdfboundingboxheight by \mdf@middlelinewidth@length\relax%
2464 \advance\mdfboundingboxheight by \mdf@outerlinewidth@length\relax}}}%
2465 \psset{lineararc=\mdf@roundcorner@length, cornersize=absolute}%
2466 \expandafter\psset\expandafter{\mdf@psset@local}%
2467 \mdf@makebox@in[\mdfboundingboxwidth]{%
2468 \null%
2469 \psset{unit=1truecm}%
2470 \ifdimgreater{\mdfboundingboxheight}{\vsize}
2471 {\begin{pspicture}(0,0)(\mdfboundingboxwidth,\vsize)}
2472 {\begin{pspicture}(0,0)(\mdfboundingboxwidth,\mdfboundingboxheight)}
2473 \mdfpstricks@settings%
2474 \psset{lineararc=\mdf@roundcorner@length, cornersize=absolut,}%
2475 \expandafter\psset\expandafter{\mdf@psset@local}%
2476 \pnode(\mdf@innerleftmargin@length,\mdf@splitbottomskip@length){mdf@A}
2477 \pnode(0,0){mdf@0}
2478 \pnode(\mdfboundingboxwidth,\mdfboundingboxheight){mdf@P}
2479 \ifbool{mdf@leftline}%
2480 {%
2481 \nodexn{(\mdf@A)+(\mdf@outerlinewidth@length,0)
2482 +(\mdf@middlelinewidth@length,0)
2483 +(\mdf@innerlinewidth@length,0)}}{mdf@A}
2484 \nodexn{(\mdf@0)+(\mdf@outerlinewidth@length,0)
2485 +0.5(\mdf@middlelinewidth@length,0)}}{mdf@0}
2486 }{}%
2487 \ifbool{mdf@rightline}%
2488 {%
2489 \nodexn{(\mdf@P)-(\mdf@outerlinewidth@length,0)
2490 -0.5(\mdf@middlelinewidth@length,0)}}{mdf@P}
2491 }{}%
2492 \ifbool{mdf@topline}%
2493 {%
2494 \nodexn{(\mdf@P)-(0,\mdf@outerlinewidth@length)
2495 -0.5(0,\mdf@middlelinewidth@length)}}{mdf@P}
2496 }{}%
2497 % \psclip{
2498 %Four or Three lines
2499 \ifboolexpr{test {\mdf@test@lrb} or test {\mdf@test@lrb}}%
2500 {\mdf@pstricksbox@tl{(\mdf@0)(\mdf@0|\mdf@P)(\mdf@P)(\mdf@P|\mdf@0)}}%
2501 }{}%
2502 %two combined lines
2503 \ifboolexpr{test {\mdf@test@ltb} or test {\mdf@test@lt}}%
2504 {\mdf@pstricksbox@tcl{(\mdf@0)(\mdf@P|\mdf@0)(\mdf@P)}}%
2505 {(\mdf@0)(\mdf@0|\mdf@P)(\mdf@P)}}{}%
2506 \ifboolexpr{test {\mdf@test@trb} or test {\mdf@test@tr}}%
2507 {\mdf@pstricksbox@tcl{(\mdf@P|\mdf@0)(\mdf@0)(\mdf@0|\mdf@P)}}%
2508 {(\mdf@0|\mdf@P)(\mdf@P)(\mdf@P|\mdf@0)}}{}%
2509 %two not combined lines
2510 \ifboolexpr{test {\mdf@test@lrb} or test {\mdf@test@lrb}}%
2511 {\mdf@pstricksbox@tnc1{(\mdf@0|\mdf@P)}}{(\mdf@P|\mdf@0)}}{}%

```



```

2512 %single line
2513 \ifboolexpr{test {\mdf@test@tb} or test {\mdf@test@t}}%
2514     {\mdf@pstricksbox@ol{\mdf@P}(\mdf@O|\mdf@P)}}{}
2515 \ifboolexpr{test {\mdf@test@lb} or test {\mdf@test@l}}%
2516     {\mdf@pstricksbox@ol{\mdf@O}(\mdf@O|\mdf@P)}}{}
2517 \ifboolexpr{test {\mdf@test@rb} or test {\mdf@test@r}}%
2518     {\mdf@pstricksbox@ol{\mdf@P}(\mdf@P|\mdf@O)}}{}
2519 %no line
2520 \mdf@test@b{\psframe[style=mdfbackgroundstyle](mdf@O)(mdf@P)}}{}%
2521 \mdf@test@noline{\psframe[style=mdfbackgroundstyle](mdf@O)(mdf@P)}}{}%
2522 % }
2523 %Frametitlebackground
2524 \drawbackgroundframetitle@first
2525 %output%
2526 \rput[bl](mdf@A){\box\mdf@splitbox@two}
2527 % \psdot(mdf@A)\uput[90](mdf@A){mdf at A}
2528 % \psdot(mdf@P)\uput[90](mdf@P){mdf at P}
2529 % \psdot(mdf@O)\uput[90](mdf@O){mdf at O}
2530 % \endpsclip
2531 \end{pspicture}
2532 }%
2533 \mdf@makeboxalign@right%
2534 }%
2535 \fi
2536 }%
2537 \def\drawbackgroundframetitle@first{%
2538 \ifdefempty{\mdf@frametitle}}{}%
2539 \ifdimgreater{\mdfboundingboxheight}{\mdfframetitleboxtotalheight}%
2540 {%
2541 \drawbackgroundframetitle@@first
2542 \global\mdfframetitleboxtotalheight=-\p@%
2543 }{\mdf@PackageWarning{You got a page break inside the frame title\MessageBreak
2544     Currently this isn't well supported}%
2545 \drawbackgroundframetitle@@first
2546 \global\mdfframetitleboxtotalheight=\dimexpr\mdfframetitleboxtotalheight
2547     -\mdfboundingboxheight
2548     -\mdf@innerlinewidth@length-0.5\mdf@middlelinewidth@length%
2549     +\mdf@frametitlebelowskip@length+\mdf@splitbottomskip@length
2550     +\mdf@splittopskip@length
2551     +\dp\strutbox\relax%
2552 }%
2553 }%
2554 }%
2555 \def\drawbackgroundframetitle@@first{%
2556 \begingroup%
2557 \ifbool{mdf@leftline}{%
2558     \nodexn{(\mdf@O)+(\mdf@innerlinewidth@length,0)
2559         +0.5(\mdf@middlelinewidth@length,0)}{\mdf@O}%
2560     }{}%
2561 \ifbool{mdf@rightline}{%
2562     \nodexn{(\mdf@P)-(\mdf@innerlinewidth@length,0)
2563         -0.5(\mdf@middlelinewidth@length,0)}{\mdf@P}%
2564     }{}%
2565 \ifbool{mdf@topline}{%
2566     \nodexn{(\mdf@P)-(0,\mdf@innerlinewidth@length)
2567         -0.5(0,\mdf@middlelinewidth@length)}{\mdf@P}%

```



```

2568     }{}%
2569 \ifdimgreater{\mdfboundingboxheight}{\mdfframetitleboxtotalheight}
2570     {\nodexn{(mdf@P)-(0,\mdfframetitleboxtotalheight)}{mdf@F}}%
2571     {\nodexn{(mdf@0)}{mdf@F}}%
2572 \psline[style=mdfframetitlebackgroundstyle](mdf@0|mdf@F)(mdf@0|mdf@P)
2573     (mdf@P)(mdf@P|mdf@F)%
2574 \endgroup
2575 }

```

\mdf@putbox@middle

Middle output

```

2576 \def\mdf@putbox@middle{%
2577   \ifvoid\mdf@splitbox@two
2578   \else%
2579     \mdf@makebox@out{%
2580       \mdf@makeboxalign@left%
2581       % \ifbool{mdf@leftline}{\hspace*{\mdf@middlelinewidth@length}}{}%
2582       \setlength\mdfboundingboxwidth{\wd\mdf@splitbox@two}%
2583       \advance\mdfboundingboxwidth by \mdf@innerleftmargin@length\relax%
2584       \advance\mdfboundingboxwidth by \mdf@innerrightmargin@length\relax%
2585       \ifbool{mdf@leftline}{%
2586         \advance\mdfboundingboxwidth by \mdf@innerlinewidth@length\relax%
2587         \advance\mdfboundingboxwidth by \mdf@middlelinewidth@length\relax%
2588         \advance\mdfboundingboxwidth by \mdf@outerlinewidth@length\relax}%{}%
2589       \ifbool{mdf@rightline}{%
2590         \advance\mdfboundingboxwidth by \mdf@innerlinewidth@length\relax%
2591         \advance\mdfboundingboxwidth by \mdf@middlelinewidth@length\relax%
2592         \advance\mdfboundingboxwidth by \mdf@outerlinewidth@length\relax}%{}%
2593       \setlength\mdfboundingboxheight{\dimexpr\ht\mdf@splitbox@two+\dp\mdf@splitbox@two\relax}%
2594       \advance\mdfboundingboxheight by \mdf@splitbottomskip@length\relax%
2595       \psset{unit=1truecm}%
2596       \mdf@makebox@in[\mdfboundingboxwidth]{%
2597         \null%
2598         \ifdimgreater{\mdfboundingboxheight}{\vsize}
2599           {\begin{pspicture}(0,0)(\mdfboundingboxwidth,\vsize)}
2600           {\begin{pspicture}(0,0)(\mdfboundingboxwidth,\mdfboundingboxheight)}
2601             \mdfpstricks@settings%
2602             \psset{lineararc=0pt, cornersize=absolut,}%
2603             \expandafter\psset\expandafter{\mdf@psset@local}%
2604             %%%
2605             \pnode(\mdf@innerleftmargin@length,\mdf@splitbottomskip@length){mdf@A}
2606             \pnode(0,0){mdf@0}
2607             \pnode(\mdfboundingboxwidth,\mdfboundingboxheight){mdf@P}
2608             \ifbool{mdf@leftline}%
2609               {%
2610                 \nodexn{(mdf@A)+(\mdf@outerlinewidth@length,0)
2611                   +(\mdf@middlelinewidth@length,0)
2612                   +(\mdf@innerlinewidth@length,0)}{mdf@A}
2613                 \nodexn{(mdf@0)+(\mdf@outerlinewidth@length,0)
2614                   +0.5(\mdf@middlelinewidth@length,0)}{mdf@0}
2615               }{}%
2616             \ifbool{mdf@rightline}%
2617               {%
2618                 \nodexn{(mdf@P)-(\mdf@outerlinewidth@length,0)

```

```

2619             -0.5(\mdf@middlelinewidth@length,0)){mdf@P}
2620         }{}%
2621     %%
2622     \ifbool{bool {mdf@leftline} and bool {mdf@rightline}}%
2623         {\mdf@pstricksbox@tncl{(\mdf@0|mdf@P)}{(\mdf@P|mdf@0)}}{}%
2624     \ifbool{bool {mdf@leftline} and not (bool {mdf@rightline})}%
2625         {\mdf@pstricksbox@ol{(\mdf@0)(mdf@0|mdf@P)}}{}%
2626     \ifbool{not (bool {mdf@leftline}) and bool {mdf@rightline}}%
2627         {\mdf@pstricksbox@ol{(\mdf@P)(mdf@P|mdf@0)}}{}%
2628     \ifbool{not (bool {mdf@leftline}) and not (bool {mdf@rightline})}%
2629         {\psframe[style=mdfbackgroundstyle](mdf@0)(mdf@P)}{}%
2630 %Frametitlebackground
2631     \drawbackgroundframetitle@middle
2632 %output%
2633     \rput[bl](mdf@A){\box\mdf@splitbox@two}
2634 %     \psdot(mdf@A)\uput[90](mdf@A){mdf at A}
2635 %     \psdot(mdf@P)\uput[90](mdf@P){mdf at P}
2636 %     \psdot(mdf@0)\uput[90](mdf@0){mdf at 0}
2637     \end{pspicture}%
2638 }%
2639 \mdf@makeboxalign@right%
2640 }%
2641 \fi
2642 }%
2643 \def\drawbackgroundframetitle@middle{%
2644 \ifdefempty{\mdf@frametitle}{}{}%
2645 \ifdimless{\mdfframetitleboxtotalheight}{\z@}
2646 {}{}%
2647 \drawbackgroundframetitle@@middle
2648 \global\mdfframetitleboxtotalheight=-\p@ \relax%
2649 }%
2650 }%
2651 }%
2652 \def\drawbackgroundframetitle@@middle{%
2653 \begingroup%
2654 \ifbool{mdf@leftline}{}%
2655     \nodexn{(\mdf@0)+(\mdf@innerlinewidth@length,0)}
2656     +0.5(\mdf@middlelinewidth@length,0){mdf@0}%
2657     }{}%
2658 \ifbool{mdf@rightline}{}%
2659     \nodexn{(\mdf@P)-(\mdf@innerlinewidth@length,0)}
2660     -0.5(\mdf@middlelinewidth@length,0){mdf@P}%
2661     }{}%
2662 \nodexn{(\mdf@P)-(0,\mdfframetitleboxtotalheight)}{mdf@F}%
2663 \psline[style=mdfframetitlebackgroundstyle,linearcs=\z@](mdf@0|mdf@F)(mdf@0|mdf@P)
2664     (mdf@P)(mdf@P|mdf@F)%
2665 \endgroup
2666 }

```

\mdf@putbox@second

Last output

```

2667 \def\mdf@putbox@second{
2668 \ifvoid\mdf@splitbox@one
2669 \else%

```

```

2670 \mdf@makebox@out{%
2671   \mdf@makeboxalign@left%
2672 %   \ifbool{mdf@leftline}{\hspace*{\mdf@middlelinewidth@length}}{}%
2673   \setlength\mdfboundingboxwidth{\wd\mdf@splitbox@one}%
2674   \advance\mdfboundingboxwidth by \mdf@innerleftmargin@length\relax%
2675   \advance\mdfboundingboxwidth by \mdf@innerrightmargin@length\relax%
2676   \ifbool{mdf@leftline}{%
2677     \advance\mdfboundingboxwidth by \mdf@innerlinewidth@length\relax%
2678     \advance\mdfboundingboxwidth by \mdf@middlelinewidth@length\relax%
2679     \advance\mdfboundingboxwidth by \mdf@outerlinewidth@length\relax}{}%
2680   \ifbool{mdf@rightline}{%
2681     \advance\mdfboundingboxwidth by \mdf@innerlinewidth@length\relax%
2682     \advance\mdfboundingboxwidth by \mdf@middlelinewidth@length\relax%
2683     \advance\mdfboundingboxwidth by \mdf@outerlinewidth@length\relax}{}%
2684   \setlength\mdfboundingboxheight{\dimexpr\ht\mdf@splitbox@one+\dp\mdf@splitbox@one\relax}%
2685   \advance\mdfboundingboxheight by \mdf@innerbottommargin@length\relax%
2686   \ifbool{mdf@bottomline}{%
2687     \advance\mdfboundingboxheight by \mdf@innerlinewidth@length\relax%
2688     \advance\mdfboundingboxheight by \mdf@middlelinewidth@length\relax%
2689     \advance\mdfboundingboxheight by \mdf@outerlinewidth@length\relax}{}%
2690   \psset{unit=1truecm}%
2691   \mdf@makebox@in[\mdfboundingboxwidth]{%
2692     \null%
2693     \begin{pspicture}(0,0)(\mdfboundingboxwidth,\mdfboundingboxheight)
2694       \mdfpstricks@settings%
2695       \psset{lineararc=\mdf@roundcorner@length, cornersize=absolut,}%
2696       \expandafter\psset\expandafter{\mdf@psset@local}%
2697       \pnode(\mdf@innerleftmargin@length,\mdf@innerbottommargin@length){mdf@A}
2698       \pnode(0,0){mdf@0}
2699       \pnode(\mdfboundingboxwidth,\mdfboundingboxheight){mdf@P}
2700       \ifbool{mdf@leftline}%
2701         {%
2702           \nodexn{(\mdf@A)+(\mdf@outerlinewidth@length,0)
2703                 +(\mdf@middlelinewidth@length,0)
2704                 +(\mdf@innerlinewidth@length,0)}{mdf@A}
2705           \nodexn{(\mdf@0)+(\mdf@outerlinewidth@length,0)
2706                 +0.5(\mdf@middlelinewidth@length,0)}{mdf@0}
2707         }{}%
2708       \ifbool{mdf@rightline}%
2709         {%
2710           \nodexn{(\mdf@P)-(\mdf@outerlinewidth@length,0)
2711                 -0.5(\mdf@middlelinewidth@length,0)}{mdf@P}
2712         }{}%
2713       \ifbool{mdf@bottomline}%
2714         {%
2715           \nodexn{(\mdf@A)+(0,\mdf@outerlinewidth@length)
2716                 +(0,\mdf@middlelinewidth@length)
2717                 +(0,\mdf@innerlinewidth@length)}{mdf@A}
2718           \nodexn{(\mdf@0)+(0,\mdf@outerlinewidth@length)
2719                 +0.5(0,\mdf@middlelinewidth@length)}{mdf@0}
2720         }{}%
2721       %Four + Three
2722       \ifboolexpr{test {\mdf@test@lrb} or test {\mdf@test@lrb}}%
2723         {\mdf@pstricksbox@tl{(\mdf@0|\mdf@P)(\mdf@0)(\mdf@P|\mdf@0)(\mdf@P)}}{}%
2724       %Two combined
2725       \ifboolexpr{test {\mdf@test@ltb} or test {\mdf@test@lb}}%

```

```

2726      {\mdf@pstricksbox@tcl{(mdf@P|mdf@0)(mdf@P)(mdf@0|mdf@P)}%
2727      {(mdf@0|mdf@P)(mdf@0)(mdf@P|mdf@0)}}{}
2728      \ifbool{test {\mdf@test@trb} or test {\mdf@test@rb}}%
2729      {\mdf@pstricksbox@tcl{(mdf@P)(mdf@0|mdf@P)(mdf@0)}%
2730      {(mdf@0)(mdf@P|mdf@0)(mdf@P)}}{}
2731      %Two not combined
2732      \ifbool{test {\mdf@test@ltr} or test {\mdf@test@lr}}%
2733      {\mdf@pstricksbox@tnc{(mdf@0|mdf@P)}{(mdf@P|mdf@0)}}{}%
2734      %one line
2735      \ifbool{test {\mdf@test@tb} or test {\mdf@test@b}}%
2736      {\mdf@pstricksbox@ol{(mdf@0)(mdf@P|mdf@0)}}{}
2737      \ifbool{test {\mdf@test@lt} or test {\mdf@test@l}}%
2738      {\mdf@pstricksbox@ol{(mdf@0)(mdf@0|mdf@P)}}{}
2739      \ifbool{test {\mdf@test@tr} or test {\mdf@test@r}}%
2740      {\mdf@pstricksbox@ol{(mdf@P)(mdf@P|mdf@0)}}{}
2741      %no line
2742      \mdf@test@t{\psframe[style=mdfbackgroundstyle](mdf@0)(mdf@P)}{}%
2743      \mdf@test@noline{\psframe[style=mdfbackgroundstyle](mdf@0)(mdf@P)}{}%
2744      %Frametitlebackground
2745      \drawbackgroundframetitle@second
2746      %output%
2747      \rput[bl](mdf@A){\box\mdf@splitbox@one}
2748      % \psdot(mdf@A)\uput[90](mdf@A){mdf at A}
2749      % \psdot(mdf@P)\uput[90](mdf@P){mdf at P}
2750      % \psdot(mdf@0)\uput[90](mdf@0){mdf at 0}
2751      \end{pspicture}%
2752      }%
2753      \mdf@makeboxalign@right%
2754      }%
2755      \fi
2756      }%
2757      \def\drawbackgroundframetitle@second{%
2758      \ifdefempty{\mdf@frametitle}}{}%
2759      \ifdimless{\mdfframetitleboxtotalheight}{\z@}
2760      {}{}%
2761      \drawbackgroundframetitle@@second
2762      }%
2763      }%
2764      }%
2765      \def\drawbackgroundframetitle@@second{%
2766      \begingroup%
2767      \ifbool{mdf@leftline}%
2768      \nodexn{(mdf@0)+(\mdf@innerlinewidth@length,0)
2769      +0.5(\mdf@middlelinewidth@length,0)}{mdf@0}%
2770      }{}%
2771      \ifbool{mdf@rightline}%
2772      \nodexn{(mdf@P)-(\mdf@innerlinewidth@length,0)
2773      -0.5(\mdf@middlelinewidth@length,0)}{mdf@P}%
2774      }{}%
2775      \nodexn{(mdf@P)-(0,\mdfframetitleboxtotalheight)}{mdf@F}%
2776      \psline[style=mdfframetitlebackgroundstyle,linear=\z@](mdf@0|mdf@F)(mdf@0|mdf@P)
2777      (mdf@P)(mdf@P|mdf@F)%
2778      \endgroup
2779      }
2780      \endinput

```

2781 %eof

## C. The file *mdframed-example-default*

```

2782 %Documentation of the package mdframed
2783 %$Id: mdframed.dtx 312 2012-01-08 12:43:36Z marco $
2784 \setcounter{errorcontextlines}{999}
2785 \documentclass[parskip=false,english,11pt]{ltxmdf}
2786 \ltxmdfsetifoot $Id: mdframed.dtx 312 2012-01-08 12:43:36Z marco $
2787
2788 \usepackage{showexpl}
2789 \lstset{style=lstltxmdf,explpreset={pos=b,rframe={}},}
2790
2791 \newcommand\Loadedframemethod{default}
2792 \usepackage[framemethod=\Loadedframemethod]{mdframed}
2793
2794 \title{The \Pack{mdframed} package}
2795 \subtitle{Examples for \Opt{framemethod=\Loadedframemethod}}
2796 \author{\href{mailto:marco.daniel@mada-nada.de}{Marco Daniel}}
2797 \version{\mdversion}
2798 \introduction{In this document I collect various examples for \Opt{framemethod=\Loadedframemethod}.
2799 Some presented examples are more or less exorbitant.}
2800
2801 \mdfsetup{skipabove=\topskip,skipbelow=\topskip}
2802 \newrobustcmd\ExampleText{%
2803     An \textit{inhomogeneous linear} differential equation has the form
2804     \begin{align}
2805         L[v] &= f,
2806     \end{align}
2807     where  $L$  is a linear differential operator,  $v$  is
2808     the dependent variable, and  $f$  is a given non-zero
2809     function of the independent variables alone.
2810 }
2811
2812 \newcounter{examplecount}
2813 \setcounter{examplecount}{0}
2814 \renewcommand\thesubsection{}
2815 \newcommand\Examplesec[1]{%
2816 \stepcounter{examplecount}%
2817 \subsection{Example~\arabic{examplecount}~---\#1\relax}%
2818 }
2819
2820 \begin{document}
2821 \maketitle
2822 \section{Loading}
2823 In the preamble only the package \Pack{mdframed} with the option \Opt{framemethod=\Loadedframemethod}
2824
2825 {\large\color{red!50!black}
2826 \NOTE Every \Cmd{global} inside the examples is necessary to work with the package \Pack{showexpl}.}
2827
2828 \section{Examples}
2829 All examples have the following settings:
2830
2831 \begin{tltxmdfexample}
2832 \mdfsetup{skipabove=\topskip,skipbelow=\topskip}

```

```

2833 \newrobustcmd\ExampleText{%
2834 An \textit{inhomogeneous linear} differential equation
2835 has the form
2836 \begin{align}
2837 L[v] = f,
2838 \end{align}
2839 where  $L$  is a linear differential operator,  $v$  is
2840 the dependent variable, and  $f$  is a given non-zero
2841 function of the independent variables alone.
2842 }
2843 \end{tltxmdfexample}
2844 \clearpage
2845 \Examplesec{very simple}
2846 \begin{LTXexample}
2847 \global\mdfdefinestyle{exampledefault}{%
2848     linecolor=red,linewidth=3pt,%
2849     leftmargin=1cm,rightmargin=1cm
2850 }
2851 \begin{mdframed}[style=exampledefault]
2852 \ExampleText
2853 \end{mdframed}
2854 \end{LTXexample}
2855
2856 \Examplesec{hidden line + frame title}
2857 \begin{LTXexample}
2858 \global\mdfapptodefinestyle{exampledefault}{%
2859     topline=false,rightline=true,bottomline=false}
2860 \begin{mdframed}[style=exampledefault,frametitle={Inhomogeneous linear}]
2861 \ExampleText
2862 \end{mdframed}
2863 \end{LTXexample}
2864 \clearpage
2865
2866 \Examplesec{colored frame title}
2867 \begin{LTXexample}
2868
2869 \global\mdfapptodefinestyle{exampledefault}{%
2870     rightline=true,innerleftmargin=10,innerrightmargin=10,
2871     frametitlerule=true,frametitlerulecolor=green,
2872     frametitlebackgroundcolor=yellow,
2873     frametitlerulewidth=2pt}
2874 \begin{mdframed}[style=exampledefault,frametitle={Inhomogeneous linear}]
2875 \ExampleText
2876 \end{mdframed}
2877 \end{LTXexample}
2878
2879 \Examplesec{framed picture which is centered}
2880 \begin{LTXexample}
2881 \begin{mdframed}[userdefinedwidth=6cm,align=center,
2882     linecolor=blue,linewidth=4pt]
2883 \includegraphics[width=\linewidth]{donald-duck}
2884 \end{mdframed}
2885 \end{LTXexample}
2886
2887 \clearpage
2888 \Examplesec{Theorem environments}

```

```

2889 \begin{LTXexample}
2890 \mdfdefinestyle{theoremstyle}{%
2891     linecolor=red,linewidth=2pt,%
2892     frametitle=rule=true,%
2893     frametitlebackgroundcolor=gray!20,
2894     innertopmargin=\topskip,
2895 }
2896 \mdtheorem[style=theoremstyle]{definition}{Definition}
2897 \begin{definition}
2898 \ExampleText
2899 \end{definition}
2900 \begin{definition}[Inhomogeneous linear]
2901 \ExampleText
2902 \end{definition}
2903 \begin{definition*}[Inhomogeneous linear]
2904 \ExampleText
2905 \end{definition*}
2906 \end{LTXexample}
2907
2908
2909 \clearpage
2910 \Examplesec{theorem with separate header and the help of TikZ (complex)}
2911 \begin{LTXexample}
2912 \newcounter{theo}[section]
2913 \newenvironment{theo}[1][1]{%
2914     \stepcounter{theo}%
2915     \ifstrempy{#1}%
2916     {\mdfsetup{%
2917         frametitle={%
2918             \tikz[baseline=(current bounding box.east),outer sep=0pt]
2919             \node[anchor=east,rectangle,fill=blue!20]
2920             {\strut Theorem~\thetheo};}}
2921     }%
2922     {\mdfsetup{%
2923         frametitle={%
2924             \tikz[baseline=(current bounding box.east),outer sep=0pt]
2925             \node[anchor=east,rectangle,fill=blue!20]
2926             {\strut Theorem~\thetheo:~#1};}}%
2927     }%
2928     \mdfsetup{innertopmargin=10pt,linecolor=blue!20,%
2929         linewidth=2pt,topline=true,
2930         frametitleaboveskip=\dimexpr-\ht\strutbox\relax,}
2931     \begin{mdframed}[]\relax%
2932     }\end{mdframed}}
2933 \begin{theo}[Inhomogeneous Linear]
2934 \ExampleText
2935 \end{theo}
2936
2937 \begin{theo}
2938 \ExampleText
2939 \end{theo}
2940 \end{LTXexample}
2941
2942 \clearpage
2943 \Examplesec{hide only a part of a line}
2944 The example below is inspired by the following post on StackExchange \href{http://tex.stackexchange.com

```

```

2945 \begin{LTExample}
2946 \makeatletter
2947 \newlength{\interruptlength}
2948 \setlength{\interruptlength}{2.5ex}
2949 \newrobustcmd\overlaplines{%
2950   \appto\mdf@frame@leftline@single{%
2951     \llap{\color{white}%
2952       \rule[\dimexpr-\mdfboundingboxdepth+\interruptlength\relax]{%
2953         {\mdf@middlelinewidth@length}%
2954         {\dimexpr\mdfboundingboxtotalheight%
2955           \ifbool{mdf@topline}{+\mdf@middlelinewidth@length}{}}
2956         -2\interruptlength\relax}%
2957     }%
2958   }%
2959   \appto\mdf@frame@rightline@single{%
2960     \rlap{\color{white}%
2961       \hspace*{\mdfboundingboxwidth}%
2962       \hspace*{\mdf@innerrightmargin@length}%
2963       \rule[\dimexpr-\mdfboundingboxdepth%
2964         +\interruptlength\relax]{%
2965         {\mdf@middlelinewidth@length}%
2966         {\dimexpr\mdfboundingboxtotalheight%
2967           +\ifbool{mdf@topline}{\mdf@middlelinewidth@length}{0pt}}
2968         -2\interruptlength\relax}%
2969     }%
2970   }%
2971 }
2972 \makeatother
2973 \overlaplines
2974
2975 \begin{mdframed}[linecolor=blue,linewidth=8pt]
2976 \ExampleText
2977 \end{mdframed}
2978 \end{LTExample}
2979 \end{document}
2980 \endinput

```

## D. The file mdframed-example-tikz

```

2981 %Documentation of the package mdframed
2982 %$Id: mdframed.dtx 312 2012-01-08 12:43:36Z marco $
2983 \setcounter{errorcontextlines}{999}
2984 \documentclass[parskip=false,english,11pt]{ltxmdf}
2985 \ltxmdfsetifoot $Id: mdframed.dtx 312 2012-01-08 12:43:36Z marco $
2986
2987 \usepackage{showexpl}
2988 \lstset{style=lstltxmdf,explpreset={pos=b,rframe={}},}
2989
2990 \newcommand\Loadedframemethod{TikZ}
2991 \usepackage[framemethod=\Loadedframemethod]{mdframed}
2992
2993 \title{The \Pack{mdframed} package}
2994 \subtitle{Examples for \Opt{framemethod=\Loadedframemethod}}
2995 \author{\href{mailto:marco.daniel@mada-nada.de}{Marco Daniel}}
2996 \version{\mdversion}
2997 \introduction{In this document I collect various examples for \Opt{framemethod=\Loadedframemethod}.

```



```

2998 Some presented examples are more or less exorbitant.}
2999
3000 \mdfsetup{skipabove=\topskip,skipbelow=\topskip}
3001 \newrobustcmd\ExampleText{%
3002     An \textit{inhomogeneous linear} differential equation has the form
3003     \begin{align}
3004         L[v] = f,
3005     \end{align}
3006     where  $L$  is a linear differential operator,  $v$  is
3007     the dependent variable, and  $f$  is a given non-zero
3008     function of the independent variables alone.
3009 }
3010
3011 \newcounter{examplecount}
3012 \setcounter{examplecount}{0}
3013 \renewcommand\thesubsection{}
3014 \newcommand\Examplesec[1]{%
3015 \stepcounter{examplecount}%
3016 \subsection{Example~\arabic{examplecount}~---~#1\relax}%
3017 }
3018
3019 \begin{document}
3020 \maketitle
3021 \section{Loading}
3022 In the preamble only the package \Pack{mdframed} with the option \Opt{framemethod=Loadedframemethod}
3023
3024 {\large\color{red!50!black}
3025 \NOTE Every \Cmd{global} inside the examples is necessary to work with the package \Pack{showexpl}.}
3026
3027 \section{Examples}
3028 All examples have the following settings:
3029
3030 \begin{tltxmdfexample}
3031 \mdfsetup{skipabove=\topskip,skipbelow=\topskip}
3032 \newrobustcmd\ExampleText{%
3033 An \textit{inhomogeneous linear} differential equation
3034 has the form
3035 \begin{align}
3036 L[v] = f,
3037 \end{align}
3038 where  $L$  is a linear differential operator,  $v$  is
3039 the dependent variable, and  $f$  is a given non-zero
3040 function of the independent variables alone.
3041 }
3042 \end{tltxmdfexample}
3043 \clearpage
3044 \ExampleText{round corner}
3045 \begin{LTExample}
3046 \global\mdfdefinestyle{exampledefault}{%
3047     outerlinewidth=5pt,innerlinewidth=0pt,
3048     outerlinecolor=red,roundcorner=5pt
3049 }
3050 \begin{mdframed}[style=exampledefault]
3051 \ExampleText
3052 \end{mdframed}
3053 \end{LTExample}

```

```

3054
3055 \Examplesec{hidden line + frame title}
3056 \begin{LTXexample}
3057 \global\mdfapptodefinesstyle{exampledefault}{%
3058   topline=false,leftline=false,}
3059 \begin{mdframed}[style=exampledefault,frametitle={Inhomogeneous linear}]
3060 \ExampleText
3061 \end{mdframed}
3062 \end{LTXexample}
3063 \clearpage
3064 \Examplesec{framed picture which is centered}
3065 \begin{LTXexample}
3066 \begin{mdframed}[userdefinedwidth=6cm,align=center,
3067   linecolor=blue,middlelinewidth=4pt,roundcorner=5pt]
3068 \includegraphics[width=\linewidth]{donald-duck}
3069 \end{mdframed}
3070 \end{LTXexample}
3071
3072 \Examplesec{Gimmick}
3073 \begin{LTXexample}
3074 \mdfsetup{splitbottomskip=0.8cm,splittopskip=0cm,
3075   innerrightmargin=2cm,innertopmargin=1cm,%
3076   innerlinewidth=2pt,outerlinewidth=2pt,
3077   middlelinewidth=10pt,backgroundcolor=red,
3078   linecolor=blue,middlelinecolor=gray,
3079   tikzsetting={draw=yellow,line width=3pt,%
3080     dashed,%
3081     dash pattern= on 10pt off 3pt},
3082   rightline=false,bottomline=false}
3083 \begin{mdframed}
3084 \ExampleText
3085 \end{mdframed}
3086 \end{LTXexample}
3087
3088 \Examplesec{complex example with TikZ}
3089
3090 \begin{tltxmdfexample}
3091 \tikzstyle{titregris} =
3092   [draw=gray, thick, fill=white, shading = exersicetitle, %
3093   text=gray, rectangle, rounded corners,
3094   right,minimum height=.7cm]
3095
3096 \pgfdeclarehorizontalshading{exersicebackground}{100bp}
3097 {color(0bp)=(green!40);
3098 color(100bp)=(black!5)}
3099
3100 \pgfdeclarehorizontalshading{exersicetitle}{100bp}
3101 {color(0bp)=(red!40);
3102 color(100bp)=(black!5)}
3103
3104 \newcounter{exercise}
3105 \renewcommand\theexercise{Exercise~\n\arabic{exercise}}
3106 \makeatletter
3107 \def\mdf@@exercisepoints{}
3108 \define@key{mdf}{exercisepoints}{%
3109   \def\mdf@@exercisepoints{#1}

```

```

3110 }
3111 \renewrobustcmd\mdfcreateextratikz{%
3112     \node[titregris,xshift=1cm] at (P-|0) %
3113         {\~\mdf@frametitlefont{\theexercise}\~};
3114     \ifdefempty{\mdf@@exercisepoints}%
3115     {%
3116         \node[titregris,left,xshift=-1cm] at (P)%
3117             {\~\mdf@frametitlefont{\mdf@@exercisepoints points}\~};}%
3118 }
3119 \makeatother
3120
3121 \mdfdefinestyle{exercisestyle}{%
3122     outerlinewidth=1pt,
3123     innerlinewidth=0pt,
3124     roundcorner=2pt,
3125     linecolor=gray,
3126     tikzsetting={shading = exersicebackground},
3127     innertopmargin=1.2\baselineskip,
3128     skipabove={\dimexpr0.5\baselineskip+\topskip\relax},
3129     needspace=3\baselineskip,
3130     frametitlefont=\sffamily\bfseries,
3131     settings={\global\stepcounter{exercise}},
3132 }
3133
3134 \begin{mdframed}[style=exercisestyle,]
3135 \ExampleText
3136 \end{mdframed}
3137
3138 \begin{mdframed}[style=exercisestyle,exercisepoints=10]
3139 \ExampleText
3140 \end{mdframed}
3141 \end{tltxmdfexample}
3142
3143 \tikzstyle{titregris} =
3144     [draw=gray, thick, fill=white, shading = exersicetitle, %
3145     text=gray, rectangle, rounded corners,
3146     right,minimum height=.7cm]
3147
3148 \pgfdeclarehorizontalshading{exersicebackground}{100bp}
3149 {color(0bp)=(green!40);
3150 color(100bp)=(black!5)}
3151
3152 \pgfdeclarehorizontalshading{exersicetitle}{100bp}
3153 {color(0bp)=(red!40);
3154 color(100bp)=(black!5)}
3155
3156 \newcounter{exercise}
3157 \renewcommand\theexercise{Exercise~\n\arabic{exercise}}
3158 \makeatletter
3159 \def\mdf@@exercisepoints{}
3160 \define@key{mdf}{exercisepoints}{%
3161     \def\mdf@@exercisepoints{#1}
3162 }
3163 \newrobustcmd\mdfcreateextratikzlocal{%
3164     \node[titregris,xshift=1cm] at (P-|0) {\~\textbf{\theexercise}\~};
3165     \ifdefempty{\mdf@@exercisepoints}%

```

```

3166     {}%
3167     {\node[titregris,left,xshift=-1cm] at (P)%
3168       {\mdf@frametitlefont{\mdf@exercisepoints points}~};}%
3169 }
3170 \makeatother
3171
3172 \mdfdefinestyle{exercisestyle}{%
3173   outerlinewidth=1pt,
3174   innerlinewidth=0pt,
3175   roundcorner=2pt,
3176   linecolor=gray,
3177   tikzsetting={shading = exersicebackground},
3178   innertopmargin=1.2\baselineskip,
3179   skipabove={\dimexpr0.5\baselineskip+\topskip\relax},
3180   needspace=3\baselineskip,
3181   frametitlefont=\sffamily\bfseries,
3182   settings={\global\stepcounter{exercise}\let\mdfcreateextratikz\mdfcreateextratikzlocal},
3183 }
3184
3185 \begin{mdframed}[style=exercisestyle,]
3186 \ExampleText
3187 \end{mdframed}
3188
3189 \begin{mdframed}[style=exercisestyle,exercisepoints=10]
3190 \ExampleText
3191 \end{mdframed}
3192
3193 \clearpage
3194 \Examplesec{Theorem environments}
3195 \begin{LTXexample}
3196 \mdfdefinestyle{theoremstyle}{%
3197   linecolor=red,linewidth=2pt,%
3198   frametitlerule=true,%
3199   apptotikzsetting={\tikzset{mdfframetitlebackground/.append style={%
3200     shade,left color=white, right color=blue!20}}},
3201   frametitlerulecolor=green!60,
3202   frametitlerulewidth=1pt,
3203   innertopmargin=\topskip,
3204 }
3205 \mdtheorem[style=theoremstyle]{definition}{Definition}
3206 \begin{definition}[Inhomogeneous linear]
3207 \ExampleText
3208 \end{definition}
3209 \begin{definition*}[Inhomogeneous linear]
3210 \ExampleText
3211 \end{definition*}
3212 \end{LTXexample}
3213
3214 \end{document}
3215 \endinput

```

## E. The file *mdframed-example-pstricks*

```

3216 %Documenation of the package mdframed
3217 %$Id: mdframed.dtx 312 2012-01-08 12:43:36Z marco $
3218 \setcounter{errorcontextlines}{999}

```

```

3219 \documentclass[parskip=false,english,11pt]{ltxmdf}
3220 \ltxmdfsetifoot$Id: mdframed.dtx 312 2012-01-08 12:43:36Z marco $
3221
3222 \lstDeleteShortInline{}}
3223 \newcommand\Loadedframemethod{PSTricks}
3224 \usepackage[framemethod=\Loadedframemethod]{mdframed}
3225
3226 \usepackage{showexpl}
3227 \lstset{style=lstltxmdf,explpreset={pos=b,rframe={}},}
3228
3229 \title{The \Pack{mdframed} package}
3230 \subtitle{Examples for \Opt{framemethod=\Loadedframemethod}}
3231 \author{\href{mailto:marco.daniel@mada-nada.de}{Marco Daniel}}
3232 \version{\mdversion}
3233 \introduction{In this document I collect various examples for \Opt{framemethod=\Loadedframemethod}.
3234 Some presented examples are more or less exorbitant.}
3235
3236 \mdfsetup{skipabove=\topskip,skipbelow=\topskip}
3237 \newrobustcmd\ExampleText{%
3238     An \textit{inhomogeneous linear} differential equation has the form
3239     \begin{align}
3240         L[v] = f,
3241     \end{align}
3242     where  $L$  is a linear differential operator,  $v$  is
3243     the dependent variable, and  $f$  is a given non-zero
3244     function of the independent variables alone.
3245 }
3246
3247 \newcounter{examplecount}
3248 \setcounter{examplecount}{0}
3249 \renewcommand\thesubsection{}
3250 \newcommand\Examplesec[1]{%
3251 \stepcounter{examplecount}%
3252 \subsection{Example~\arabic{examplecount}~---~\#1\relax}%
3253 }
3254
3255 \begin{document}
3256 \maketitle
3257 \section{Loading}
3258 In the preamble only the package \Pack{mdframed} with the option \Opt{framemethod=\Loadedframemethod}
3259
3260 {\large\color{red!50!black}
3261 \NOTE Every \Cmd{global} inside the examples is necessary to work with the package \Pack{showexpl}.}
3262 X
3263 \section{Examples}
3264 All examples have the following settings:
3265
3266 \begin{tltltxmdfexample}
3267 \mdfsetup{skipabove=\topskip,skipbelow=\topskip}
3268 \newrobustcmd\ExampleText{%
3269 An \textit{inhomogeneous linear} differential equation
3270 has the form
3271 \begin{align}
3272 L[v] = f,
3273 \end{align}
3274 where  $L$  is a linear differential operator,  $v$  is

```

```

3275 the dependent variable, and  $f$  is a given non-zero
3276 function of the independent variables alone.
3277 }
3278 \end{tltxmdfexample}
3279 \clearpage
3280
3281 \Examplesec{very simple}
3282 \begin{LTExample}
3283 \global\mdfdefinestyle{exampledefault}{%
3284     linecolor=red,middlelinewidth=3pt,%
3285     leftmargin=1cm,rightmargin=1cm
3286 }
3287 \begin{mdframed}[style=exampledefault,roundcorner=5]
3288 \ExampleText
3289 \end{mdframed}
3290 \end{LTExample}
3291
3292 \Examplesec{hidden line + frame title}
3293 \begin{LTExample}
3294 \global\mdfapptodefinestyle{exampledefault}{%
3295     topline=false,rightline=false,bottomline=false,
3296     frametitlerule=true,innertopmargin=6pt,
3297     outerlinewidth=6pt,outerlinecolor=blue,
3298     pstricksappsetting={\addtopsstyle{mdfouterlinestyle}{linestyle=dashed}},
3299     innerlinecolor=yellow,innerlinewidth=5pt}%
3300 \begin{mdframed}[style=exampledefault,frametitle={Inhomogeneous linear}]
3301 \ExampleText
3302 \end{mdframed}
3303 \end{LTExample}
3304
3305 \clearpage
3306
3307 \Examplesec{Dash Lines}
3308 \begin{LTExample}
3309 \global\mdfdefinestyle{exampledefault}{%
3310     pstrickssetting={linestyle=dashed,},linecolor=red,linewidth=5pt}
3311 \begin{mdframed}[style=exampledefault,]
3312 \ExampleText
3313 \end{mdframed}
3314 \end{LTExample}
3315
3316 \Examplesec{Double Lines}
3317 \begin{LTExample}
3318 \global\mdfdefinestyle{exampledefault}{%
3319     pstrickssetting={doubleline=true,doublesep=6pt},
3320     linecolor=red,linewidth=5pt,middlelinewidth=4pt}
3321 \begin{mdframed}[style=exampledefault,]
3322 \ExampleText
3323 \end{mdframed}
3324 \end{LTExample}
3325 \end{document}
3326 \endinput

```

## F. The file *mdframed-example-texsx*

```

3327 %Documentation of the package mdframed

```

```

3328 %$Id: mdframed.dtx 312 2012-01-08 12:43:36Z marco $
3329 \setcounter{errorcontextlines}{999}
3330 \documentclass[parskip=false,english,11pt,ltxlipsum]{ltxmdf}
3331 \ltxmdfsetifoot $Id: mdframed.dtx 312 2012-01-08 12:43:36Z marco $
3332
3333 \usepackage{showexpl}
3334 \lstset{style=lstltxmdf,explpreset={pos=b,rframe={}}},}
3335
3336 \newcommand\Loadedframemethod{default}
3337 \usepackage[framemethod=\Loadedframemethod]{mdframed}
3338
3339 \title{The \Pack{mdframed} package}
3340 \subtitle{Examples for \Opt{framemethod=\Loadedframemethod}}
3341 \author{\href{mailto:marco.daniel@mada-nada.de}{Marco Daniel}}
3342 \version{\mdversion}
3343 \introduction{In this document I collect various examples for \Opt{framemethod=\Loadedframemethod}.
3344 Some presented examples are more or less exorbitant.}
3345
3346 \mdfsetup{skipabove=\topskip,skipbelow=\topskip}
3347 \newrobustcmd\ExampleText{%
3348     An \textit{inhomogeneous linear} differential equation has the form
3349     \begin{align}
3350         L[v] = f,
3351     \end{align}
3352     where  $L$  is a linear differential operator,  $v$  is
3353     the dependent variable, and  $f$  is a given non-zero
3354     function of the independent variables alone.
3355 }
3356
3357 \newcounter{examplecount}
3358 \setcounter{examplecount}{0}
3359 \renewcommand\thesubsection{}
3360 \newcommand\Examplesec[1]{%
3361 \stepcounter{examplecount}%
3362 \subsection{Example~\arabic{examplecount}~---~\#1\relax}%
3363 }
3364
3365 \begin{document}
3366 \maketitle
3367 \section{Loading}
3368 In the preamble only the package \Pack{mdframed} with the option \Opt{framemethod=\Loadedframemethod}
3369
3370 {\large\color{red!50!black}
3371 \NOTE Every \Cmd{global} inside the examples is necessary to work with the package \Pack{showexpl}.}
3372
3373 \section{Examples}
3374 All examples have the following settings:
3375
3376 \begin{tltxmdfexample}
3377 \mdfsetup{skipabove=\topskip,skipbelow=\topskip}
3378 \newrobustcmd\ExampleText{%
3379 An \textit{inhomogeneous linear} differential equation
3380 has the form
3381 \begin{align}
3382 L[v] = f,
3383 \end{align}

```

```

3384 where  $L$  is a linear differential operator,  $v$  is
3385 the dependent variable, and  $f$  is a given non-zero
3386 function of the independent variables alone.
3387 }
3388 \end{tltxmdfexample}
3389 \clearpage
3390 \Examplesec{Package listings}
3391 The example below is inspired by the following post on StackExchange \href{http://tex.stackexchange.com}
3392
3393 Here the solution which can be decorate as usual.
3394
3395 \begin{tltxmdfexample}[moretexcs={BeforeBeginEnvironment,AfterEndEnvironment},morekeywords={lstlisting}]
3396 \BeforeBeginEnvironment{lstlisting}{%
3397     \begin{mdframed}[<modification>%
3398         \vspace{-0.7em}}
3399 \AfterEndEnvironment{lstlisting}{%
3400     \vspace{-0.5em}%
3401     \end{mdframed}}
3402 \end{tltxmdfexample}
3403
3404 With the new command \Cmd{surroundwithmdframed} you can use
3405 \begin{tltxmdfexample}[moretexcs={BeforeBeginEnvironment,AfterEndEnvironment},morekeywords={lstlisting}]
3406 \surroundwithmdframed{listings}
3407 \end{tltxmdfexample}
3408
3409 \Examplesec{Package multicol}
3410 How I wrote in \enquote{Known Problems} you can't combine \Pack{multicol} with \Pack{mdframed}. In a s
3411 \begin{LTXexample}
3412 \begin{multicols}{2}
3413 \lipsum[1]
3414 \begin{mdframed}
3415 \ExampleText
3416 \end{mdframed}
3417 \lipsum[2]
3418 \end{multicols}
3419 \end{LTXexample}
3420 \clearpage
3421 \twocolumn[\Examplesec{Working in twocolumn mode}]
3422 \begin{tltxmdfexample}
3423 \twocolumn[%
3424     \Examplesec{Working in
3425         twocolumn mode}]
3426 \lipsum[1]\lipsum[2]
3427 \begin{mdframed}[%
3428     leftmargin=10pt,%
3429     rightmargin=10pt,%
3430     linecolor=red,
3431     backgroundcolor=yellow]
3432 \ExampleText
3433 \end{mdframed}
3434 \lipsum[2]
3435 \end{tltxmdfexample}
3436 \lipsum[1]\lipsum[2]
3437 \begin{mdframed}[leftmargin=10pt,%
3438     rightmargin=10pt,%
3439     linecolor=red,

```



```
3440                 backgroundColor=yellow]
3441 \ExampleText
3442 \end{mdframed}
3443 \lipsum[2]
3444 \clearpage
3445 \onecolumn
3446 \Examplesec{Working inside enumerate}
3447 \begin{LTXexample}
3448 Text Text Text Text Text Text Text Text
3449 \begin{enumerate}
3450 \item in the following \ldots
3451     \begin{mdframed}[linecolor=blue,linewidth=2]
3452         \ExampleText
3453     \end{mdframed}
3454 \item \lipsum[2]
3455 \end{enumerate}
3456 Text Text Text Text Text Text
3457 \end{LTXexample}
3458 \end{document}
3459 \endinput
```

## G. Change History

v1.0a		Defining <code>mdframed</code> with <code>\newenvironment</code>	35
General: Created dtx and fixes bugs	1	Joining all new definitions	26
v1.0b		Redefinition of <code>\newmdtheoremenv</code> . – Now	
General: added command <code>\@parboxrestore</code>		check of theorem definition.	29
to <code>\mdf@lrbox</code>	27	Removing <code>\@arrayparboxrestore</code>	37
removed <code>\setbox\mdf@splitbox@two</code>		Renamed some commands so that every	
<code>\vbox\unvbox \mdf@splitbox@two</code>	40	command have the same prefix <code>\mdf@</code>	1
v1.1beta		v1.1release	
General: added command to avoid overfull		General: Added <code>\mbox</code> to the definition.	
box warning by <code>vsplit</code>	28	<code>\item\mbox\relax</code> – Need for <code>amsthm</code>	28
Added <code>frametitle</code> detection to		changed definition of <code>\mdf@lrbox</code> (Thanks	
<code>\detected@mdf@put@frame</code>	34	Lars Madsen)	27
added lost semicolons	53	Changed the enddefinition of <code>mdframed</code> .	
Added method frame title via <code>\savebox</code>	31	Uses now <code>\@doendpe</code> instead of	
Added option <code>frametitlerulecolor</code> ,		<code>\endparenv</code>	35
<code>frametitlebackgroundcolor</code> , font	23	Edit algorithm to combine the	
Added option <code>titleaboveskip</code> ,		saveboxes <code>\mdf@frametitlebox</code> and	
<code>titlebelowskip</code> , <code>frametitlerulewidth</code>	22	<code>\mdf@splitboxone</code> by the predefined set-	
Added option <code>usetwoside</code>	23	tings: <code>\parskip\z@</code> , <code>\parindent\z@</code> and	
Changed the definition of <code>\mdf@trivlist</code>	35	<code>\offinterlineskip</code>	31
Create new <code>\savebox</code> and renamed		expand definition of <code>\mdf@lrbox</code> by	
<code>\@tempboxa</code>	26	<code>\mdf@restoreparams</code>	27

## H. Index

The index only collect package relevant words.

Symbols	D	
\' ..... 347	\DeclareDocumentCommand . ..... 428, 440	2861, 2875, 2898, 2901, 2904, 2934, 2938, 2976, 3001, 3032, 3044, 3051, 3060, 3084, 3135, 3139, 3186, 3190, 3207, 3210, 3237, 3268, 3288, 3301, 3312, 3322, 3347, 3378, 3415, 3432, 3441, 3452
\- ..... 346	defaultunit (option) ..... 6	
\= ..... 347	\deferred@thm@head . 367, 368	
\@par ..... 345	\detected@mdf@put@frame . .. 558, 670, 671, 736, 741	
\@acci ..... 347	\DisableKeyvalOption .... ..... 1158, 1159	
\@accii ..... 347	\documentclass ..... .. 2785, 2984, 3219, 3330	<b>F</b>
\@acciii ..... 347	\draw ..... 1624	font (option) ..... 8
\@definecounter .... 448, 468	\drawbrackgroundframetitle@first ..... 1791, 1795, 1806, 2541, 2545, 2555	fontcolor (option) ..... 8
\@dischph ..... 346	\drawbrackgroundframetitle@middle .. 1928, 1934, 2647, 2652	footnotedistance (option) 13
\@doendpe ..... 747	\drawbrackgroundframetitle@second .. 2025, 2030, 2761, 2765	footnoteinside (option) .. 13
\@flushglue ..... 352	\drawbrackgroundframetitle@single .. 1763, 1766, 2419, 2422	framemethod (option) ..... 5
\@itemlabel ..... 380	\drawbrackgroundframetitle@first .. 1787, 1912, 2524, 2537	frametitle (option) ..... 11
\@namedef ..... 499	\drawbrackgroundframetitle@middle .. 1924, 2010, 2631, 2643	frametitleaboveskip (op- tion) ..... 11
\@nameuse ..... 499	\drawbrackgroundframetitle@second .. 2021, 2133, 2745, 2757	frametitlealignment (op- tion) ..... 11
\@newctr ..... 468	\drawbrackgroundframetitle@single .. 1749, 1761, 2403, 2417	frametitlebackgroundcolor (option) ..... 11
\@nmbrlistfalse ..... 375		frametitlebelowskip (op- tion) ..... 11
\@temptitle ..... 453, 455, 460, 463, 464, 476, 478, 483, 487, 489, 494, 503, 505, 510, 513, 514		frametitlefont (option) .. 11
\@thmcounter ... 449, 469, 472		frametitlerule (option) .. 11
\@thmcountersep ..... 471		frametitlerulewidth (op- tion) ..... 11
\@totalleftmargin ..... 350		
\@trivlist ..... 376		
\' ..... 347		
\_ .... 460, 463, 483, 510, 513		
<b>A</b>	<b>E</b>	<b>G</b>
\addtopstyle ... 2162, 3298	\endgroup ..... 30, 258, 358, 560, 578, 599, 747, 889, 1005, 1059, 1083, 1626, 2255, 2270, 2291, 2439, 2574, 2665, 2778	\global ..... 499, 555, 557, 571, 572, 573, 574, 575, 591, 597, 1313, 1321, 1491, 1792, 1796, 1929, 2542, 2546, 2648, 2847, 2858, 2869, 3046, 3057, 3131, 3182, 3283, 3294, 3309, 3318
align (option) ..... 9	\endmdf@lrbbox ..... 330, 358, 553, 569, 734, 739	
apptotikzsetting (option) 10	\endmdf@trivlist ..... ..... 371, 386, 387, 746	
\arabic ..... 2817, 3016, 3105, 3157, 3252, 3362	\endpsclip 2211, 2219, 2233, 2252, 2268, 2410, 2530	<b>H</b>
\author 2796, 2995, 3231, 3341	\enquote ..... 3410	hidealllines (option) .... 10
	\everypar ..... 354	\href ..... 2796, 2944, 2995, 3231, 3341, 3391
<b>B</b>	\Examplesec ..... 2815, 2845, 2856, 2866, 2879, 2888, 2910, 2943, 3014, 3055, 3064, 3072, 3088, 3194, 3250, 3281, 3292, 3307, 3316, 3360, 3390, 3409, 3421, 3424, 3446	<b>I</b>
backgroundcolor (option) .. 8	\ExampleText ..... ... 2802, 2833, 2852,	\if@mdf@pageodd . 751, 775, 786
\booltrue ..... 522		\if@nobreak ..... 343
bottomline (option) ..... 10		\if@noskipsec ..... 344
<b>C</b>		\ifcsdef ..... 441
\clearpage ..... 2844, 2864, 2887, 2909, 2942, 3043, 3063, 3193, 3279, 3305, 3389, 3420, 3444		\ifdefempty ..... 726, 735, 740, 1287, 1382, 1459, 1526, 1762, 1788,
\Cmd ..... 2823, 2826, 3022, 3025, 3258, 3261, 3368, 3371, 3404		
\csappto ..... 405		
\CurrentOption ..... 261		

1925, 2022, 2418, 2538, 2644, 2758, 3114, 3165	\lstset 2789, 2988, 3227, 3334	\mdf@currentvbadness 361, 364
\iffalse ..... 343, 344	\ltxmdfsetifoot ..... .. 2786, 2985, 3220, 3331	\mdf@defaultunit ..... 29
\ifmdf@bottomline ..... 526		\mdf@deferred@thm@head .. 367
\ifmdf@footnoteinside ... 731		\mdf@define@key@length .. ..... 43, 47, 61
\ifmdf@frametitlebottomline ..... 526	<b>M</b>	\mdf@do@alignoption .... ..... 81, 81, 201, 201
\ifmdf@frametitleleftline 523	\makeatletter 2946, 3106, 3158	\mdf@do@booloption ..... ..... 72, 72, 184, 184
\ifmdf@frametitlerightline ..... 525	\makeatother 2972, 3119, 3170	\mdf@do@lengthoption .... ... 56, 56, 133, 133, 159
\ifmdf@frametitletopline 524	\makelabel ..... 381	\mdf@do@stringoption .... ..... 63, 63, 159
\ifmdf@leftline ..... 523	\maketitle ..... .. 2821, 3020, 3256, 3366	\mdf@dolist ..... 42, 42, 133, 159, 184, 201, 804, 854, 880, 915, 1017
\ifmdf@nobreak ..... 672	margin (option) ..... 7	\mdf@endparenv ..... 387, 388
\ifmdf@rightline ..... 525	\mbox ..... 383	\mdf@fontcolor .... 723, 1557
\ifmdf@topline ..... 524	\mdf@@exercisepoints .... 3107, 3109, 3114, 3117, 3159, 3161, 3165, 3168	\mdf@footnotedistance@length ..... 618
\IfNoValueTF ... 429, 444, 446	\mdf@@framemethod 116, 118, 120	\mdf@footnotebox ..... 295
\ifstrempty .... 452, 463, 475, 486, 502, 513, 2915	\mdf@@frametitle 520, 581, 726	\mdf@footnoteinput ..... ..... 612, 624, 722
\IfValueTF ..... 431, 432	\mdf@@frametitle@use .... ..... 585, 735, 740	\mdf@footnoteoutput .... ..... 612, 615, 733, 742
\ifvmode ..... 724	\mdf@@frametitlerule .... ..... 593, 942, 970, 1043, 1182, 1617, 2280	\mdf@footnoterule 612, 612, 620
\ignorespaces ..... 354	\mdf@@setzref ..... 751, 785, 887, 1003, 1057, 1080	\mdf@frame@background@first ..... 1298, 1298, 1381
\includegraphics . 2883, 3068	\mdf@advancelength@freevspace@add ..... 835, 841, 1017	\mdf@frame@background@middle ..... 1469, 1476, 1525
\indent ..... 368	\mdf@advancelength@freevspace@sub ..... 835, 838, 915	\mdf@frame@background@second ..... 1392, 1392, 1458
innerbottommargin (option) 7	\mdf@advancelength@horizontalmargin@add ..... 798	\mdf@frame@background@single ..... 1197, 1197, 1286
innerleftmargin (option) .. 7	\mdf@advancelength@horizontalmargin@sub ..... 798, 804	\mdf@frame@background@second ..... 1392, 1392, 1458
innerlinecolor (option) ... 8	\mdf@advancelength@verticalmargin@add ..... 835, 835, 854, 880	\mdf@frame@background@single ..... 1197, 1197, 1286
innerlinewidth (option) ... 8	\mdf@align ..... 208, 208	\mdf@frame@bottomline@second ..... 1392, 1416, 1457
innermargin (option) ..... 7	\mdf@alignoption@triple do ..... 81, 82, 84	\mdf@frame@bottomline@single ..... 1222, 1285
innerrightmargin (option) . 7	\mdf@Ax ..... 1671, 1679, 1680, 1751, 1861, 1869, 1870, 1914, 1978, 1986, 1987, 2012, 2077, 2085, 2086, 2135	\mdf@frame@frametitlebackground@first ..... 1305, 1382
innertopmargin (option) ... 7	\mdf@Ay ..... 1672, 1692, 1693, 1751, 1862, 1914, 1979, 2012, 2078, 2098, 2099, 2135	\mdf@frame@frametitlebackground@middle ..... 1483, 1526
\interruptlength 2947, 2948, 2952, 2956, 2964, 2968	\mdf@background@default . ..... 1175, 1175, 1198, 1299, 1393, 1477	\mdf@frame@frametitlebackground@second ..... 1399, 1459
\introduction ..... .. 2798, 2997, 3233, 3343	\mdf@backgroundcolor .... ..... 169, 171, 1175, 1559, 1560, 2164, 2165	\mdf@frame@frametitlebackground@single ..... 1204, 1287
\itemindent ..... 379	\mdf@background@default . ..... 1175, 1175, 1198, 1299, 1393, 1477	\mdf@frame@leftline@first ..... 1298, 1329, 1378
<b>L</b>	\mdf@backgroundcolor .... ..... 169, 171, 1175, 1559, 1560, 2164, 2165	\mdf@frame@leftline@middle ..... 1469, 1469, 1524
\labelwidth ..... 377	\mdf@booloption@double do ..... 72, 73, 75	\mdf@frame@leftline@second ..... 1392, 1409, 1455
\ldots ..... 3450	\mdf@checknththeorem ..... ..... 602, 603, 720	\mdf@frame@leftline@single .. 1197, 1233, 1282, 2950
\leavevmode ..... 382		\mdf@frame@rightline@first ..... 1298, 1345, 1385
leftline (option) ..... 10		
\leftmargin ..... 378		
leftmargin (option) ..... 7		
\leftskip ..... 351		
linecolor (option) ..... 8		
\lineskip ..... 352		
linewidth (option) ..... 7		
\lipsum . 3413, 3417, 3426, 3434, 3436, 3443, 3454		
\Loadedframemethod ..... 2791, 2792, 2795, 2798, 2823, 2990, 2991, 2994, 2997, 3022, 3223, 3224, 3230, 3233, 3258, 3336, 3337, 3340, 3343, 3368		
\lstDeleteShortInline .. 3222		

\mdf@frame@rightline@middle ..... 1469, 1494, 1529	\mdf@frametitle@rulecolor ..... 529, 1180, 1614, 2275, 2276	658, 664, 810, 815, 825, 830, 904, 919, 1021, 1029, 1270, 1564, 1576, 1579, 1648, 1652, 1660, 1664, 1681, 1694, 1770, 1774, 1778, 1798, 1810, 1814, 1818, 1838, 1842, 1850, 1871, 1938, 1942, 1963, 1967, 1988, 2034, 2038, 2058, 2062, 2069, 2087, 2100, 2174, 2177, 2190, 2193, 2313, 2317, 2325, 2329, 2333, 2350, 2363, 2425, 2429, 2433, 2451, 2455, 2462, 2483, 2548, 2558, 2562, 2566, 2586, 2590, 2612, 2655, 2659, 2677, 2681, 2687, 2704, 2717, 2768, 2772
\mdf@frame@rightline@second ..... 1392, 1425, 1462	\mdf@frametitle@rulecolor@default ..... 1180, 1187	\mdf@innermargin@length ..... 759, 779, 781
\mdf@frame@rightline@single .. 1197, 1241, 1290, 2959	\mdf@frametitle@rulewidth@length ..... 531, 1184, 1191, 1625, 2286	\mdf@innerrightmargin@length ... 1190, 1244, 1261, 1347, 1362, 1427, 1441, 1496, 1510, 1623, 1646, 1836, 1961, 2056, 2311, 2449, 2584, 2675, 2962
\mdf@frame@topandbottomline@single ..... 1197	\mdf@frametitle@settings . 537	\mdf@innertopmargin@length ..... 903, 945, 973, 1046, 1194, 1216, 1267, 1340, 1367, 1629, 1657, 1847, 2294, 2323, 2459
\mdf@frame@topline@first ..... 1298, 1337, 1380	\mdf@freepage@space . . . . .. 788, 788, 869, 900, 913	\mdf@keeplines@single . . . ..... 823, 823, 857, 883
\mdf@frame@topline@single ..... 1212, 1284	\mdf@freepage@length 323, 793, 794, 795, 869, 870, 872, 884, 899, 900, 902, 914, 1015, 1025, 1027, 1035	\mdf@leftmargin@length 202, 206, 209, 759, 779, 782
\mdf@frame@Idate@svn . . . . ..... 1545, 1546, 1548	\mdf@Fy . . . . . 1780, 1783, 1784, 1820, 1823, 1824, 1944, 1947, 1948, 2040, 2043, 2044	\mdf@lengthoption@doubledo ..... 56, 57, 59
\mdf@frame@IIdate@svn . . . . ..... 2153, 2154, 2156	\mdf@hidealllines@check . ..... 704, 704, 716	\mdf@linecolor 166, 167, 168, 170, 653, 654, 655, 661, 667
\mdf@framemethod . . . 106, 106	\mdf@horizontalmargin@equation ..... 338, 798, 802	\mdf@linecolor@bottom . . . ..... 536, 1175
\mdf@framemethod@i . . . . ..... 107, 112, 115	\mdf@horizontal@spaceofbox ..... 340, 798, 799, 801, 803, 810, 811, 812, 815, 816, 817, 819, 821	\mdf@linecolor@default . . . ..... 1175, 1181, 1213, 1223, 1234, 1242, 1330, 1338, 1346, 1410, 1417, 1426, 1470, 1495
\mdf@framemethod@ii . . . . ..... 108, 113, 117	\mdf@horizontalwidthofbox@length ..... 324	\mdf@linewidth@length . . . ..... 148, 651, 659, 665
\mdf@framemethod@iii . . . . ..... 109, 114, 119	\mdf@iflength . . . . 26, 27, 50	\mdf@load@style . 630, 630, 646
\mdf@frame@Odate@svn . . . . ..... 1170, 1171, 1173	\mdf@iflength@check 26, 28, 32	\mdf@LoadFile@IfExist . . . ..... 8, 10, 98, 99, 101, 102, 122, 128, 129, 130
\mdf@frametitle . . . . . .. 582, 726, 735, 740, 1287, 1382, 1459, 1526, 1762, 1788, 1925, 2022, 2418, 2538, 2644, 2758	\mdf@iflength@cleanup . 38, 41	\mdf@lrbox . . . . . .. 330, 330, 550, 566, 728
\mdf@frametitle@aboveskip@length ..... 576, 600	\mdf@ifstreq@expand . . . . ..... 275, 280, 282, 284	\mdf@maindate@svn . . . . 1, 3, 6
\mdf@frametitle@alignment ..... 534, 551, 567	\mdf@ignore@evbadness . . . . 360, 360, 554, 556, 570, 590, 596, 933, 961, 1034	
\mdf@frametitle@background@default ..... 1176, 1205, 1308, 1316, 1402, 1486	\mdf@innerbottommargin@length ..... 1216, 1265, 1268, 1444, 1446, 1658, 1672, 2067, 2078, 2322, 2343, 2685, 2697	
\mdf@frametitle@backgroundcolor ..... 530, 1176, 1561, 2170, 2171	\mdf@innerleftmargin@length 1186, 1189, 1260, 1288, 1361, 1383, 1440, 1460, 1509, 1527, 1621, 1623, 1645, 1671, 1835, 1861, 1960, 1978, 2055, 2077, 2310, 2343, 2448, 2476, 2583, 2605, 2674, 2697	
\mdf@frametitle@belowskip@length .... 576, 1185, 1323, 1620, 1799, 2283, 2549	\mdf@innerlinecolor . 653, 661, 667, 1177, 1578, 2192	
\mdf@frametitle@bottomrulecolor ..... 536	\mdf@innerlinecolor@default ..... 1177	
\mdf@frametitle@box . . . . . ..... 294, 555, 557, 566, 571, 572, 573, 574, 575, 592, 941, 969, 1042	\mdf@innerlinewidth@length ..... 650,	
\mdf@frametitle@font . . . . 549, 565, 3113, 3117, 3168		
\mdf@frametitle@fontcolor 565		
\mdf@frametitle@leftmargin@length ..... 532		
\mdf@frametitle@rightmargin@length ..... 533		

\mdf@makebox@in . 391, 396, 1278, 1374, 1451, 1520, 1667, 1856, 1974, 2073, 2337, 2467, 2596, 2691	2660, 2672, 2678, 2682, 2688, 2703, 2706, 2711, 2716, 2719, 2769, 2773, 2953, 2955, 2965, 2967	\mdf@pageisodd . . . . . 751
\mdf@makebox@out 391, 391, 1255, 1357, 1436, 1505, 1640, 1831, 1955, 2050, 2307, 2444, 2579, 2670	\mdf@needspace . . . . . 249	\mdf@patchamsth . . . . . 365
\mdf@makeboxalign@left . . . . 208, 209, 214, 217, 1256, 1358, 1437, 1506, 1641, 1832, 1956, 2051, 2308, 2445, 2580, 2671	\mdf@option@length 43, 43, 60	\mdf@patchamsthm 332, 366, 370
\mdf@makeboxalign@right . . . 208, 210, 215, 218, 1294, 1388, 1465, 1532, 1757, 1920, 2017, 2140, 2413, 2533, 2639, 2753	\mdf@outerlinecolor . . . . . . . 655, 1179, 1571, 2184	\mdf@print@space 274, 278, 868
\mdf@middlelinecolor . . . . . . . 654, 1178, 1586, 2201	\mdf@outerlinecolor@default . . . . . 1179	\mdf@printheight . . . 276, 286
\mdf@middlelinecolor@default . . . . . 1178, 1181	\mdf@outerlinewidth@length . . 652, 660, 666, 812, 817, 827, 832, 906, 921, 1023, 1031, 1271, 1569, 1572, 1650, 1654, 1662, 1666, 1680, 1683, 1688, 1693, 1696, 1701, 1840, 1844, 1852, 1870, 1873, 1877, 1881, 1965, 1969, 1987, 1990, 1995, 2060, 2064, 2071, 2086, 2089, 2094, 2099, 2102, 2182, 2185, 2315, 2319, 2327, 2331, 2335, 2348, 2351, 2356, 2361, 2364, 2369, 2453, 2457, 2464, 2481, 2484, 2489, 2494, 2588, 2592, 2610, 2613, 2618, 2679, 2683, 2689, 2702, 2705, 2710, 2715, 2718	\mdf@psset@local . . . . . . . 221, 228, 230, 2342, 2466, 2475, 2603, 2696
\mdf@middlelinewidth@length . . 651, 659, 665, 811, 816, 826, 831, 905, 920, 1022, 1030, 1218, 1223, 1225, 1227, 1228, 1229, 1236, 1238, 1247, 1249, 1270, 1275, 1277, 1332, 1334, 1342, 1349, 1351, 1371, 1372, 1377, 1412, 1417, 1418, 1420, 1421, 1422, 1429, 1448, 1449, 1454, 1472, 1498, 1517, 1518, 1523, 1565, 1572, 1579, 1584, 1587, 1588, 1649, 1653, 1661, 1665, 1681, 1683, 1688, 1693, 1696, 1701, 1770, 1774, 1778, 1798, 1810, 1814, 1818, 1839, 1843, 1851, 1871, 1873, 1877, 1881, 1938, 1942, 1964, 1968, 1988, 1990, 1995, 2034, 2038, 2059, 2063, 2070, 2087, 2089, 2094, 2100, 2102, 2175, 2178, 2185, 2193, 2198, 2200, 2314, 2318, 2326, 2330, 2334, 2349, 2352, 2357, 2362, 2365, 2370, 2426, 2430, 2434, 2446, 2452, 2456, 2463, 2482, 2485, 2490, 2495, 2548, 2559, 2563, 2567, 2581, 2587, 2591, 2611, 2614, 2619, 2656,	\mdf@outermargin@length . . . . . . 758, 778, 782	\mdf@pstricksbox@fl 2206, 2374
	\mdf@0x . . . . . 1673, 1682, 1683, 1704, 1769, 1770, 1783, 1809, 1810, 1823, 1863, 1872, 1873, 1884, 1937, 1938, 1947, 1980, 1989, 1990, 1998, 2033, 2034, 2043, 2079, 2088, 2089, 2105	\mdf@pstricksbox@ol 2257, 2395, 2396, 2397, 2398, 2514, 2516, 2518, 2625, 2627, 2736, 2738, 2740
	\mdf@0y . . . . . 1674, 1695, 1696, 1704, 1864, 1884, 1981, 1998, 2080, 2101, 2102, 2105	\mdf@pstricksbox@etcl 2222, 2381, 2383, 2385, 2387, 2504, 2507, 2726, 2729
	\mdf@PackageInfo . . . . . . . . . . 8, 9, 681, 686, 692, 697, 756, 761, 873, 950	\mdf@pstricksbox@etl . . . . . . . 2214, 2376, 2377, 2378, 2379, 2500, 2723
	\mdf@PackageInfoSpace 292, 870	\mdf@pstricksbox@etncl . . . . . . . . 2236, 2390, 2392, 2511, 2623, 2733
	\mdf@PackageNoInfo . . . . 274	\mdf@ptlength@to@pscode . . . . . . 2158, 2158, 2160
	\mdf@PackageWarning . . . . 8, 8, 14, 92, 103, 213, 261, 266, 286, 404, 442, 606, 641, 820, 848, 864, 925, 978, 1050, 1066, 1072, 1314, 1793, 2543	\mdf@ptlength@to@pscode@length . . . . . 2159, 2161
	\mdf@pageiseven . . . . . 751	\mdf@put@frame 675, 679, 862, 862, 875, 911, 988, 993, 999
		\mdf@put@frame@i 891, 896, 896
		\mdf@put@frame@ii . . 1008, 1014, 1014, 1054, 1062
		\mdf@put@frame@standalone . . . . . 673, 683, 688, 694, 699, 846, 846
		\mdf@put@frametitulerule . . . . . . 1612, 2280
		\mdf@putbox@first . . . . . . . . 1004, 1298, 1354, 1787, 1828, 2441, 2441
		\mdf@putbox@middle . . . . . . . . 1058, 1469, 1502, 1924, 1952, 2576, 2576
		\mdf@putbox@second . . . . . . . . 1081, 1392, 1433, 2021, 2047, 2667, 2667
		\mdf@putbox@single . . . . . . . . . . 858, 888, 1197, 1252, 1632, 1637, 2304
		\mdf@Px . . . . . 1675, 1687, 1688, 1705, 1773, 1774, 1784, 1813, 1814, 1824, 1865, 1876, 1877, 1885, 1941, 1942, 1948, 1982, 1994, 1995, 1999, 2037, 2038, 2044, 2081, 2093, 2094, 2106



\mdf@Py .....	1036, 1053, 1355, 1359, 1363, 1365, 1386, 1503, 1507, 1511, 1513, 1530, 1829, 1834, 1846, 1914, 1953, 1959, 1971, 2012, 2442, 2447, 2458, 2526, 2577, 2582, 2593, 2633	\mdf@test@t .....	1089, 1141, 1739, 1899, 2129, 2397, 2513, 2742
1676, 1700, 1701, 1705, 1777, 1778, 1781, 1783, 1784, 1817, 1818, 1821, 1823, 1824, 1866, 1880, 1881, 1885, 1945, 1947, 1948, 1983, 1999, 2041, 2043, 2044, 2082, 2106	\mdf@splittopskip@length ..... 932, 939, 944, 960, 967, 972, 1033, 1040, 1045, 1799, 2550	\mdf@test@tb .....	1089, 1131, 1729, 1899, 2120, 2392, 2513, 2735
\mdf@reserved@a .....	\mdf@stringoption@doubledo ..... 63, 64, 66	\mdf@test@tr .....	1089, 1122, 1155, 1720, 1893, 2126, 2385, 2506, 2739
670, 673, 675, 679, 683, 688, 694, 699, 702, 849, 858, 860, 865, 875, 890, 891, 894, 911, 988, 993, 999, 1008, 1012, 1054, 1062, 1076, 1084, 1086	\mdf@style .....	\mdf@test@trb .....	1089, 1109, 1153, 1710, 1893, 2114, 2377, 2506, 2728
\mdf@reserveda .. 732, 738, 745	\mdf@styledefinition ....	\mdf@theoremseparator ...	..... 455, 478, 489, 505
\mdf@reset .....	..... 630, 648, 721	\mdf@theoremspace .....	..... 456, 479, 490, 506
\mdf@restoreparams . 334, 354	\mdf@tempa .. 111, 115, 117, 119, 280, 282, 284, 288, 292	\mdf@theoremtitlefont ...	..... 457, 480, 491, 507
\mdf@restorevbaddness ....	\mdf@templength 26, 29, 51, 52	\mdf@tikz@settings .....	..... 1551, 1552, 1642, 1833, 1957, 2052
..... 360, 363, 364	\mdf@test@b .....	\mdf@tikzbox@otl .....	..... 1592, 1604, 1714, 1717, 1720, 1723, 1726, 1729, 1733, 1736, 1739, 1742, 1891, 1894, 1897, 1900, 1903, 1906, 2002, 2004, 2006, 2112, 2115, 2118, 2121, 2124, 2127
\mdf@rightmargin@length .	1089, 1144, 1742, 1908, 2120, 2398, 2520, 2735	\mdf@tikzbox@tfl ... 1592,	1592, 1707, 1709, 1710, 1711, 1712, 1888, 2109
.. 204, 205, 758, 778, 781	\mdf@test@l .....	\mdf@tikzset@local .....	. 221, 221, 223, 226, 1581
\mdf@roundcorner@length .	1089, 1135, 1733, 1902, 2123, 2395, 2515, 2737	\mdf@titleaboveskip@length	..... 528
1558, 1563, 2173, 2176, 2341, 2465, 2474, 2695	\mdf@test@lb .....	\mdf@titlebelowskip@length	..... 527
\mdf@setopt@body ... 520, 540	1089, 1116, 1154, 1714, 1902, 2111, 2381, 2515, 2725	\mdf@trivlist .. 371, 371, 725	
\mdf@setopt@title 520, 521, 547	\mdf@test@lr .....	\mdf@twoside@checklength	..... 717, 751, 753
\mdf@settings .....	1089, 1128, 1726, 1896, 2117, 2390, 2510, 2732	\mdf@userdefinedwidth@length	..... 396, 803
\mdf@skipabove@length ... 725	\mdf@test@lrb .....	\mdf@verticalmarginwhole@length	..... 325, 825, 826, 827, 830, 831, 832, 836, 852, 878, 884
\mdf@skipbelow@length ... 389	1112, 1154, 1712, 1896, 2108, 2379, 2510, 2722	\mdf@xcolor 237, 237, 241, 245	
\mdf@splitbottomskip@length	\mdf@test@lt .....	\mdf@zref@label . 751, 771, 786	
1027, 1340, 1365, 1368, 1513, 1515, 1799, 1848, 1862, 1972, 1979, 2460, 2476, 2549, 2594, 2605	1089, 1125, 1156, 1723, 1890, 2123, 2387, 2503, 2737	\mdfapptodefinestyle 5, 399, 402, 2858, 2869, 3057, 3294	
\mdf@splitbox@one .....	\mdf@test@ltb .....	\mdfbackgroundstyle ... 2162	
..... 296, 550, 555, 557, 591, 594, 597, 598, 728, 847, 853, 863, 867, 879, 924, 934, 936, 938, 946, 956, 959, 962, 964, 966, 974, 977, 982, 985, 986, 998, 1016, 1035, 1037, 1039, 1047, 1049, 1053, 1065, 1069, 1071, 1075, 1077, 1253, 1258, 1263, 1265, 1292, 1434, 1438, 1442, 1444, 1463, 1638, 1644, 1656, 1751, 2048, 2054, 2066, 2135, 2305, 2309, 2321, 2405, 2668, 2673, 2684, 2747	1106, 1153, 1709, 1890, 2111, 2376, 2503, 2725	\mdfboundingboxdepth ....	320, 1199, 1206, 1215, 1225, 1235, 1245, 1264, 1300, 1309, 1317, 1331,
\mdf@splitbox@two .....	\mdf@test@ltr .....		
297, 934, 935, 948, 952, 953, 956, 962, 963, 982, 990, 995, 998, 1035,	1103, 1152, 1711, 1887, 2117, 2378, 2499, 2732		
	\mdf@test@ltrb .....		
	1099, 1152, 1707, 1887, 2108, 2374, 2499, 2722		
	\mdf@test@noline .....		
	1089, 1148, 1746, 1910, 2131, 2400, 2521, 2743		
	\mdf@test@r .....		
	1089, 1138, 1736, 1905, 2126, 2396, 2517, 2739		
	\mdf@test@rb .....		
	1119, 1155, 1717, 1905, 2114, 2383, 2517, 2728		
	\mdf@test@single .....		
	1151		

1339, 1348, 1364, 1394,  
1403, 1411, 1418, 1428,  
1443, 1471, 1478, 1487,  
1497, 1512, 2952, 2963

`\mdfboundingboxheight` 319,  
1215, 1262, 1267, 1322,  
1339, 1363, 1367, 1442,  
1446, 1511, 1515, 1593,  
1605, 1656, 1657, 1658,  
1660, 1661, 1662, 1664,  
1665, 1666, 1676, 1789,  
1797, 1846, 1847, 1848,  
1850, 1851, 1852, 1866,  
1971, 1972, 1983, 2066,  
2067, 2069, 2070, 2071,  
2082, 2321, 2322, 2323,  
2325, 2326, 2327, 2329,  
2330, 2331, 2339, 2345,  
2458, 2459, 2460, 2462,  
2463, 2464, 2470, 2472,  
2478, 2539, 2547, 2569,  
2593, 2594, 2598, 2600,  
2607, 2684, 2685, 2687,  
2688, 2689, 2693, 2699

`\mdfboundingboxtotalheight`  
..... 321,  
1201, 1206, 1237, 1248,  
1266, 1302, 1306, 1309,  
1319, 1333, 1350, 1366,  
1396, 1403, 1413, 1430,  
1445, 1473, 1480, 1487,  
1499, 1514, 2954, 2966

`\mdfboundingboxtotalwidth`  
..... 317, 1200,  
1207, 1217, 1226, 1259,  
1273, 1301, 1310, 1318,  
1341, 1360, 1370, 1395,  
1404, 1419, 1439, 1447,  
1479, 1488, 1508, 1516

`\mdfboundingboxwidth` . 316,  
867, 1069, 1077, 1243,  
1257, 1260, 1346, 1359,  
1361, 1426, 1438, 1440,  
1495, 1507, 1509, 1593,  
1605, 1644, 1645, 1646,  
1648, 1649, 1650, 1652,  
1653, 1654, 1667, 1675,  
1834, 1835, 1836, 1838,  
1839, 1840, 1842, 1843,  
1844, 1856, 1865, 1959,  
1960, 1961, 1963, 1964,  
1965, 1967, 1968, 1969,  
1974, 1982, 2054, 2055,  
2056, 2058, 2059, 2060,  
2062, 2063, 2064, 2073,  
2081, 2309, 2310, 2311,

2313, 2314, 2315, 2317,  
2318, 2319, 2337, 2339,  
2345, 2447, 2448, 2449,  
2451, 2452, 2453, 2455,  
2456, 2457, 2467, 2471,  
2472, 2478, 2582, 2583,  
2584, 2586, 2587, 2588,  
2590, 2591, 2592, 2596,  
2599, 2600, 2607, 2673,  
2674, 2675, 2677, 2678,  
2679, 2681, 2682, 2683,  
2691, 2693, 2699, 2961

`\mdfcreateextratikz` . 328,  
1754, 1917, 3111, 3182

`\mdfcreateextratikzlocal`  
..... 3163, 3182

`\mdfdefinedstyle` ..... 268

`\mdfdefinestyle` .....  
... 5, 399, 399, 2847,  
2890, 3046, 3121, 3172,  
3196, 3283, 3309, 3318

`\mdffootnoteboxdepth` .... 311

`\mdffootnoteboxheight` ... 310

`\mdffootnoteboxtotalheight`  
..... 312

`\mdffootnoteboxtotalwidth` 309

`\mdffootnoteboxwidth` .... 308

`\mdfframedtitleenv` .....  
..... 520, 545, 562, 582

`\mdfframetitlebackground` 2162

`\mdfframetitleboxdepth` ..  
..... 306, 574

`\mdfframetitleboxheight` .  
..... 305, 573

`\mdfframetitleboxtotalheight`  
..... 307, 575,  
1206, 1208, 1306, 1309,  
1311, 1313, 1321, 1400,  
1403, 1405, 1484, 1487,  
1489, 1491, 1781, 1789,  
1792, 1796, 1797, 1821,  
1926, 1929, 1945, 2023,  
2041, 2436, 2539, 2542,  
2546, 2569, 2570, 2645,  
2648, 2662, 2759, 2775

`\mdfframetitleboxtotalwidth`  
..... 304

`\mdfframetitleboxwidth` 303,  
572, 1184, 1188, 1623, 2289

`\mdfframetitlerule` .... 2162

`\mdfglobal@style` ..... 90, 94

`\mdflength` ..... 4, 407, 407

`\mdflinestyle` ..... 2162

`\mdfpstricks@appendsettings`  
..... 232, 234, 2203

`\mdfpstricks@settings` 2162,  
2340, 2473, 2601, 2694

`\mdframed` ..... 712

`\mdframed@i` ..... 712

`\mdframed@ii` ..... 712

`\mdframedIIPackagename` ..  
..... 2153, 2153, 2157

`\mdframedIPackagename` ...  
..... 1545, 1545, 1549

`\mdframedOPackagename` ...  
..... 1170, 1170, 1174

`\mdframedpackagename` ....  
..... 1, 2, 7, 8, 9,  
15, 642, 682, 687, 693, 698

`\mdfsetup` . 4, 263, 263, 271,  
415, 527, 541, 600, 715,  
2801, 2832, 2916, 2922,  
2928, 3000, 3031, 3074,  
3236, 3267, 3346, 3377

`\mdfsplitboxdepth` ..... 301

`\mdfsplitboxheight` ..... 300

`\mdfsplitboxtotalheight` . 302

`\mdfsplitboxtotalwidth` .. 299

`\mdfsplitboxwidth` ..... 298

`\mdftotallinewidth` .....  
... 314, 1269, 1281, 2333

`\mdtheorem` .....  
.. 12, 413, 440, 2896, 3205

`\mdversion` ..... 1,  
1, 7, 1174, 1549, 2157,  
2797, 2996, 3232, 3342

`middlelinecolor` (option) .. 8

`middlelinewidth` (option) .. 8

## N

`needspace` (option) ..... 9

`\new\protect_\kern_\fontdimen_3\font_\kern`  
..... 294

`\newmdenv` .... 4, 413, 413, 424

`\newmdtheoremenv` 11, 413, 428

`\newsavebox` 294, 295, 296, 297

`nobreak` (option) ..... 9

`\nodexn` ..... 2348,  
2351, 2356, 2361, 2364,  
2369, 2425, 2429, 2433,  
2436, 2481, 2484, 2489,  
2494, 2558, 2562, 2566,  
2570, 2571, 2610, 2613,  
2618, 2655, 2659, 2662,  
2702, 2705, 2710, 2715,  
2718, 2768, 2772, 2775

`\noexpand` ..... 471

`\nointerlineskip` .....  
.. 542, 724, 940, 968, 1041

`\normalbaselineskip` .... 353

`\normalfont` ..... 175



<code>\normallineskip</code> . . . . . 352	<code>roundcorner</code> . . . . . 8	<b>S</b>
<code>\NOTE</code> .. 2826, 3025, 3261, 3371	<code>settings</code> . . . . . 9	<code>\section</code> . . . . .
<code>ntheorem</code> (option) . . . . . 8	<code>skipabove</code> . . . . . 7	2822, 2828, 3021, 3027,
<b>O</b>	<code>skipbelow</code> . . . . . 7	3257, 3263, 3367, 3373
<code>\offinterlineskip</code> . . . . . 589	<code>splitbottomskip</code> . . . . . 7	<code>\setcounter</code> . . . . .
<code>\onecolumn</code> . . . . . 3445	<code>splittopskip</code> . . . . . 7	2784, 2813, 2983, 3012,
<code>\Opt</code> 2795, 2798, 2823, 2994,	<code>style</code> . . . . . 9	3218, 3248, 3329, 3358
2997, 3022, 3230, 3233,	<code>theoremseparator</code> . . . . 12	<code>settings</code> (option) . . . . . 9
3258, 3340, 3343, 3368	<code>theoremspace</code> . . . . . 12	<code>\sffamily</code> . . . . . 3130, 3181
options:	<code>theoremtitlefont</code> . . . . 12	<code>skipabove</code> (option) . . . . . 7
<code>align</code> . . . . . 9	<code>tikzsetting</code> . . . . . 10	<code>skipbelow</code> (option) . . . . . 7
<code>apptotikzsetting</code> . . . . 10	<code>topline</code> . . . . . 10	<code>\smash</code> . . . . . 899
<code>backgroundcolor</code> . . . . . 8	<code>userdefinedwidth</code> . . . . 7	<code>splitbottomskip</code> (option) .. 7
<code>bottomline</code> . . . . . 10	<code>usetwoside</code> . . . . . 9	<code>splittopskip</code> (option) . . . . 7
<code>defaultunit</code> . . . . . 6	<code>xcolor</code> . . . . . 5	<code>\strut</code> . . . . . 460, 464, 483,
<code>font</code> . . . . . 8	<code>outerlinecolor</code> (option) . . 8	494, 510, 514, 2920, 2926
<code>fontcolor</code> . . . . . 8	<code>outerlinewidth</code> (option) . . 8	<code>style</code> (option) . . . . . 9
<code>footnotedistance</code> . . . . 13	<code>outermargin</code> (option) . . . . 7	<code>\subsection</code> . . . . .
<code>footnoteinside</code> . . . . . 13	<code>\overlaplines</code> . . . 2949, 2973	.. 2817, 3016, 3252, 3362
<code>framemethod</code> . . . . . 5	<b>P</b>	<code>\subtitle</code> 2795, 2994, 3230, 3340
<code>frametitle</code> . . . . . 11	<code>\Pack</code> . . . . . 2794,	<code>\surroundwithmdframed</code> . .
<code>frametitleaboveskip</code> .. 11	2823, 2826, 2993, 3022,	.. 4, 407, 409, 3406
<code>frametitlealignment</code> .. 11	3025, 3229, 3258, 3261,	<b>T</b>
<code>frametitlebackgroundcolor</code>	3339, 3368, 3371, 3410	<code>\textbf</code> . . . . . 3164
. . . . . 11	<code>\pageshrink</code> . . . . . 923	<code>\textit</code> . . . . .
<code>frametitlebelowskip</code> .. 11	<code>\parsep</code> . . . . . 374	2803, 2834, 3002, 3033,
<code>frametitlefont</code> . . . . . 11	<code>\parskip</code> . . . . . 335, 348, 587	3238, 3269, 3348, 3379
<code>frametitlerule</code> . . . . . 11	<code>\pgfdeclarehorizontalshading</code>	<code>\theexercise</code> . . . . .
<code>frametitlerulewidth</code> .. 11	.. 3096, 3100, 3148, 3152	.. 3105, 3113, 3157, 3164
<code>hidealllines</code> . . . . . 10	<code>\pgfmathsetlength</code> . . . . .	<code>\theorempostskipamount</code> .. 608
<code>innerbottommargin</code> . . . . 7	.. 1623, 1792, 1796, 1929	<code>\theorempreskipamount</code> 605, 607
<code>innerleftmargin</code> . . . . . 7	<code>\pnode</code> 2343, 2344, 2345, 2476,	<code>theoremseparator</code> (option) 12
<code>innerlinecolor</code> . . . . . 8	2477, 2478, 2605, 2606,	<code>theoremspace</code> (option) . . . . 12
<code>innerlinewidth</code> . . . . . 8	2607, 2697, 2698, 2699	<code>theoremtitlefont</code> (option) 12
<code>innermargin</code> . . . . . 7	<code>\psclip</code> . 2209, 2217, 2227,	<code>\thesubsection</code> . . . . .
<code>innerrightmargin</code> . . . . 7	2241, 2262, 2372, 2497	.. 2814, 3013, 3249, 3359
<code>innertopmargin</code> . . . . . 7	<code>\pscustom</code> . . 2227, 2242, 2262	<code>\thetheo</code> . . . . . 2920, 2926
<code>leftline</code> . . . . . 10	<code>\psdot</code> 2406, 2407, 2408, 2527,	<code>\tikz</code> . . . . . 1624, 2918, 2924
<code>leftmargin</code> . . . . . 7	2528, 2529, 2634, 2635,	<code>tikzsetting</code> (option) . . . . 10
<code>linecolor</code> . . . . . 8	2636, 2748, 2749, 2750	<code>\tikzstyle</code> . . . . . 3091, 3143
<code>linewidth</code> . . . . . 7	<code>pstricksappsetting</code> (option) 9	<code>\title</code> . 2794, 2993, 3229, 3339
<code>margin</code> . . . . . 7	<code>pstrickssetting</code> (option) .. 9	<code>topline</code> (option) . . . . . 10
<code>middlelinecolor</code> . . . . . 8	<code>\ptTps</code> . . . . . 2158, 2160, 2289	<code>\topskip</code> . . . . .
<code>middlelinewidth</code> . . . . . 8	<code>\ptTpsL</code> 2161, 2287, 2288, 2289	2801, 2832, 2894, 3000,
<code>needspace</code> . . . . . 9	<b>R</b>	3031, 3128, 3179, 3203,
<code>nobreak</code> . . . . . 9	<code>\refstepcounter</code> . 451, 474, 501	3236, 3267, 3346, 3377
<code>ntheorem</code> . . . . . 8	<code>\renewmdenv</code> . . . . . 4, 413, 421	<code>\twocolumn</code> . . . . . 3421, 3423
<code>outerlinecolor</code> . . . . . 8	<code>\renewrobustcmd</code> . . . . . 3111	<b>U</b>
<code>outerlinewidth</code> . . . . . 8	<code>repeatframetitle</code> (option) 11	<code>\unvcopy</code> 557, 592, 941, 969, 1042
<code>outermargin</code> . . . . . 7	<code>rightline</code> (option) . . . . . 10	<code>\uput</code> 2406, 2407, 2408, 2527,
<code>pstricksappsetting</code> . . . . 9	<code>rightmargin</code> (option) . . . . 7	2528, 2529, 2634, 2635,
<code>pstrickssetting</code> . . . . . 9	<code>\rightskip</code> . . . . . 351	2636, 2748, 2749, 2750
<code>repeatframetitle</code> . . . . 11	<code>roundcorner</code> (option) . . . . 8	<code>\usepackage</code> . . . . .
<code>rightline</code> . . . . . 10		2788, 2792, 2987, 2991,
<code>rightmargin</code> . . . . . 7		3224, 3226, 3333, 3337

userdefinedwidth (option) . 7	\version 2797, 2996, 3232, 3342	\xdef . . . . . 449, 469, 470
usetwoside (option) . . . . . 9	\vspace . . . . . 3398, 3400	
<b>V</b>	<b>X</b>	
\vbadness . . . . . 361, 362, 364	xcolor (option) . . . . . 5	