

# Creating diagrams for chess problems

Version v1.22

Thomas Brand  
Bornheim

Stefan Höning  
Neuss

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## Abstract

It has been more than ten years now, since we last published a documented version of the `diagram.sty`, which is mainly intended to be used for typesetting chess problems. Since 1994 I (Stefan Höning) made a couple of enhancements to the sourcecode of the style, without publishing and putting this into the documentation. We also needed to upgrade to  $\text{\LaTeX} 2\epsilon$ . The major change is the documentation language, which is english now.

The style itself tries to collect very detailed information about a chess problem by providing a lot of commands, which you may use to specify the necessary information. There are different reasons for this. One idea was to enable people to read  $\text{\LaTeX}$ -diagrams into databases with information as detailed as possible. Otherwise it should be easy to change the layout of a diagram by applying a changed style - not by changing the source.

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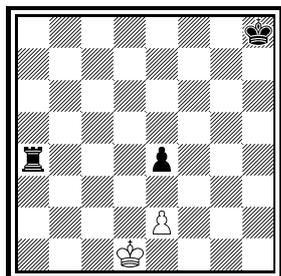
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# 1 Creating diagrams

## 1.1 An introductory example

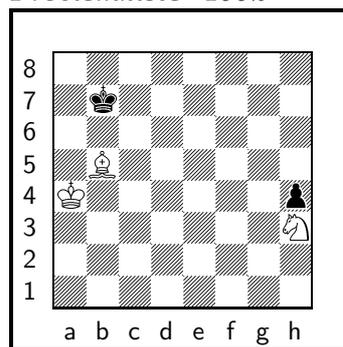
Let us first take a look at a simple example which should only show what you have to type into your L<sup>A</sup>T<sub>E</sub>X-code to get nice looking diagrams.

1  
Thomas Brand  
*Problemkiste 1992*  
*Elmar Bartel gew.*



h#7            C- (2+3)

2  
Thomas Brand  
*Problemkiste 1992*



h#5            C- (3+2)

1) Thomas Brand:

1.Ta3 Kc2!, 2.Tf3 e×f3, 3.e3 f4, 4.e2 f5, 5.e1T f6, 6.Th1! (Te7?) f7, 7.Th7 f8D#

2) Thomas Brand:

1.Ka8 Sg1, 2.h3 Ka5, 3.h2 Kb6, 4.h×g1L+ Kc7, 5.La7 Lc6#

To use the package you have to make it available to L<sup>A</sup>T<sub>E</sub>X using `\usepackage{diagram}` inside the preamble of your document.

Then you may use the `diagram` environment to create the diagrams. For the above example I had to type the following:

```
\begin{diagram}
  \author{Brand, Thomas}
  \source{Problemkiste} \year{1992}
  \dedic{Elmar Bartel gew.}
  \pieces[2+3]{wKd1, wBe2, sKh8, sBe4, sTa4}
  \stip[h\#7]
  \sol{1.Ta3 Kc2!, 2.Tf3 e\x f3, 3.e3 f4, 4.e2 f5, 5.e1T f6,
        6.Th1! (Te7?) f7, 7.Th7 f8D\#}
\end{diagram}
%
\hfill
%
\begin{diagram}
  \setboolean{legend}{true}
  \author{Brand, Thomas}
  \source{Problemkiste} \year{1992}
  \pieces[3+2]{wKa4, wLb5, wSh3, sKb7, sBh4}
  \stip[h\#5]
  \sol{1.Ka8 Sg1, 2.h3 Ka5, 3.h2 Kb6, 4.h\x g1L+ Kc7, 5.La7 Lc6\#}
\end{diagram}
```

`\putsol`

`diagram` Any information which belongs to a problem should be put between `\begin{diagram}` and `\end{diagram}`. The above examples contains information for *authors*, *source*, *year of publication*, *stipulation*, *solution* and (in diagram 1) a *dedication*.

This information is shown around a chessboard except the solution, which is collected and put into the output using the `\putsol` command.

## 1.2 Elements of a diagram

This section describes the elements which may be used inside a `diagram` environment. For most of these elements there is no sense using them between `\begin{diagram}` and `\end{diagram}`. Some of them will not work outside of the environment (like `—`). In case you use these switches anywhere outside you will specify the information for all problems in your surrounding environment (which may be the complete document).

### 1.2.1 Collecting the problem information

The following information is typically given with a problem:

- `\author`
- With the `\author` tag you specify one author or a list of authors. If you specify more than one author, you must separate them with “;”. Normally an author is given as “*sirname, givenname*”. You may change the way, how the name is interpreted by L<sup>A</sup>T<sub>E</sub>X using `\normalnames` and `\reversednames`. This `\author` command does only overwrite the default behaviour when used inside a diagram environment.
- `\Dr`  
`\Prof`  
`\ProfDr`
- Within the Authors command you should use the commands `\Dr`, `\Prof` and `\ProfDr` to specify these academic titles. So one may switch off the display of these titles — like it is generally done inside *Die Schwalbe*.
- `\pieces`
- With `\pieces` you specify the position to be displayed on the board. For each kind of piece you may specify a list of fields. Different lists of fields are separated by “;”. So the general syntax for specifying the position of a specific piece is:  
`[color][piece]{rotation of piece}[list of squares];`  
e. g. `wTa1h1` should be clear, `nKa4` is a neutral king on a4  
`w s n` may be used to specify the color of the piece.  
**K D T L S B C E X** may be used to specify the piece. A **C** is used for an imitator, **E** for an equihopper and **X** for a rotated equihopper. You may *not* use an optional rotation with **C**, **E** and **X**.  
**R U L** may be used to specify an optional rotation: right, upside-down, left. So you may use `sDUc7` for a grasshopper on `c7` — displayed as an upsidedown queen.  
The characters used to specify color, piece and rotation may be changed using the `\DefinePieces` command.
- You may also optionally specify the number of pieces in your diagram, which then will be used to control your input automatically.

There is also support for an imitator, which is typically displayed as a black filled circle. So `sCf4` will produce the symbol of an imitator. This is shown in diagram 3.

<code>\fen</code>	<ul style="list-style-type: none"> <li>As an alternative notation it is possible to enter the position in <i>Forsyth-Edwards-Notation</i>. This is possible for <math>8 \times 8</math> boards only.</li> </ul> <p>As an example: The position in diagram 2 was created via <code>\fen{8/1k6/8/1B6/K6p/7N/8/8}</code>.</p> <p>As with the <code>\pieces</code> command, you may provide the number of white and black pieces as an optional parameter.</p>
<code>\stipulation</code> <code>\stip</code>	<ul style="list-style-type: none"> <li>is used to specify the stipulation of the problem, e.g. <code>\stipulation{\#2}</code> may be used to specify <i>a mate in two</i>. There is also an abbreviation <code>\stip</code> for this macro.</li> </ul>
<code>\city</code>	<ul style="list-style-type: none"> <li>may be used to specify the city and country, where the author or the authors live. I use this inside the original section of <i>Die Schwalbe</i>. You should separate multiple cities (for multiple authors) with “;”. There is also a boolean switch <code>showcity</code>, which controls, whether this information is displayed.</li> </ul>
<code>\specialdiagram</code>	<ul style="list-style-type: none"> <li>May be used to suppress the default diagram numbering (which uses a counter) and instead directly providing a diagram “number” which may be an arbitrary text. This may also be used to suppress displaying a diagram number by providing an empty argument <code>{}</code>.</li> </ul>
<code>\sourcennr</code>	<ul style="list-style-type: none"> <li>May be used to specify the number which was used for the problem inside an originals section.</li> </ul>
<code>\source</code>	<ul style="list-style-type: none"> <li>May be used to specify the book or magazine where the problem was issued first.</li> </ul>
<code>\issue</code>	<ul style="list-style-type: none"> <li>May be used to specify e.g. the issue of a magazine where the problem was issued.</li> </ul>
<code>\pages</code>	<ul style="list-style-type: none"> <li>May be used to specify the page (or pages) where the problem was issued.</li> </ul>
<code>\day</code> <code>\month</code> <code>\months</code> <code>\year</code>	<ul style="list-style-type: none"> <li>May be used to specify the different parts of the date of publication of the problem. (E.g. for problems issued in the german magazine <i>Die Schwalbe</i> you will typically only specify the <code>\month</code> and the <code>\year</code>. For problems issued in <i>feenschach</i> you may specify a period of months like <code>\months{7-10}</code>.)</li> </ul>
<code>\tournament</code> <code>\award</code>	<ul style="list-style-type: none"> <li>May be used to specify an award and a tournament for the problem.</li> </ul>
<code>\dedication</code> <code>\dedic</code>	<ul style="list-style-type: none"> <li>May be used to specify a dedication which was given by the author of the problem.</li> </ul>
<code>\condition</code> <code>\cond</code>	<ul style="list-style-type: none"> <li>May be used to specify the fairy conditions of a problem. Different conditions should be separated with “;”.</li> </ul>
<code>\twins</code>	<ul style="list-style-type: none"> <li>May be used to specify the different twins of a problem. Different twins should be separated with “;”.</li> </ul>

- `\remark`      • May be used to specify remarks to the problem. I typically use this to explain fairy pieces on the board. You may also use the abbreviation `\rem`.
- `\rem`
- `\piecedefs`    • May be used to explain rotated pieces. An example:  
`\piecedefs{{ws}{TL}{Turm-L\"aufer-J\"ager}; {wn}{SU}{Nachtreiter}}`  
will create  
 = Turm-Läufer-Jäger  
 = Nachtreiter  
under the diagram.
- `\solution`    • `\solution` may be used to specify the solution of the problem. Normally this information is not used while displaying the board but it is only collected and may be put into your text using `\putsol`. There is also an abbreviation `\sol`.
- `\sol`
- `\judgement`   • May be used to describe the judgement given for a problem, e.g. when you are working on an award or when you are selecting problems for a “best of ...” book.
- `\comment`     • May be used to specify some comment on the problem (e.g. the authors original comment.)
- `\themes`      • May be used to specify themes displayed in the problem. Different themes should be separated with “, ”. When creating a theme index, the themes will automatically be used to create the register.
- `\genre`       • May be used to specify genre of the problem. Different genres should be separated with “, ”. The values are intended to using `\LaTeXimport` within the PDB.

When providing an empty argument to commands `\award`, `\after`, `\dedic`, `\correction` and `\version` only a warning is issued to the logfile. In previous versions of `diagram.sty` using empty arguments with the mentioned commands produced empty lines above the diagram.

There are some commands which not only collect information but normally direct result in a change of the diagram. These are:

- `\verticalcylinder`    • does not display the outer vertical lines to symbolize a verticalcylindric board.
- `\horizontalcylinder` • does not display the outer horizontal lines to symbolize a horizontalcylindric board.
- `\noframe`            • does completely suppress the outer frame e.g. to symbolize a torus board.
- `\noinnerframe`      • sometimes you need to suppress the inner frame instead of the outer frame which is achieved by using `\noinnerframe`. You may not use this together with `\noframe`.
- `\gridchess`         • displays lines to separates fieldsections for gridchess.

### 1.2.2 Modifying the layout of the diagram (and the solution)

There are a couple of switches which control the layout of the diagrams. These are typically used more generally, so you may specify these switches outside the `diagram` environment or use them in your own style, which depends on `cpd.sty`.

There are some switches which control the layout of the information which is displayed above a diagram:

- `\diagleft` • displays the information left aligned
  - `\diagcenter` • displays the information centered
  - `\diagright` • displays the information right aligned
  - `\widedias` • is like `\diagcenter` but the information shown above the diagram may span the whole width of the page. So  $\LaTeX$  will not wrap long author names.
- `\dianamestyle`    Using `\dianamestyle` (or `\solnamestyle`) you may specify how author names are written above the boards (or before the solutions). You may use this only if you use `\reversednames` (which is the default). Otherwise it is not possible to distinguish between first name and surname. You must specify one of the following options as parameter to `\dianamestyle` (or `\solnamestyle`):
- fullname** Writes the author name as *firstname surname*. This is the default.
  - surname** Writes the *surname* only.
  - short** Writes an abbreviation of the *firstname* and the *surname*. The abbreviation is calculated as follows:
    - The first letter of the *firstname* will be used.  
`\author{Brand, Thomas}` will be displayed as **T. Brand**
    - When there is a combined *firstname* separated with a hyphen, each first letter will be used. (see below)  
`\author{Reich, Hans-Peter}` will be displayed as **H.-P. Reich**
    - When specifying the author name, you may provide the abbreviation for the first name using the form *surname, firstname/abbreviation*.  
`\author{Brand, Thomas/Th.}` will be displayed as **Th. Brand**
  - noname** displays nothing
- `\diagnumbering`    The same way you may specify `\pagenumbering` you may specify the format the diagrams are numbered using `\diagnumbering` and `\pagenumbering` you may specify `arabic`, `Roman`, `roman`, `Alph` or `alph`. The default used is `arabic`. This command also switches the display for diagram numbers on.
- `\setmonthstyle`    You may also specify the way a month is displayed using `\setmonthstyle`. There are some boolean switches, which control whether a specific information is displayed. These are as follows:
- `piececounter` • This is a  $\LaTeX$  boolean, which is used to specify whether the number of pieces is displayed below the board. So you may change its value using `\setboolean{piececounter}{true}` or `\setboolean{piececounter}{false}`.

- `showcomputer`  
`\nocomputer`  
`\showcomputer`
  - There is a boolean value `computer`, which controls whether the information about a computer proof is displayed or not. This value may be changed using `\setboolean{showcomputer}{true}` or `\setboolean{showcomputer}{false}`. For backwards compatibility we support the macros `\nocomputer` and `\showcomputer`.
- `showcity`
  - This is a boolean switch, which controls whether the information gathered using the `\city` command is displayed. The default of this value is `false`.
- `showacademictitle`
  - This is a boolean switch, which controls whether academic titles `\Dr`, `\Prof` or `\ProfDr` — typically used within the `\author` command — are displayed. The default is `true`.
- `legend`
  - This boolean controls whether a legend is displayed. The default value of this value is `false`. When legends are displayed the distance between inner and outer frame is automatically adjusted.

`\notcomputerproofedsymbol` You may specify the text, which is used to indicate, whether a problem is  
`\computerproofedsymbol` proofed by a computer. To specify the symbol for a problem, which is proofed,  
is created by `\computerproofedsymbol`. To specify the symbol for a problem, which is not computer  
proofed, is created by `\notcomputerproofedsymbol`. You may redefine these commands by standard L<sup>A</sup>T<sub>E</sub>X means (`\renewcommand`).

`\selectelchfont` You may specify which font is used for the chesspieces. There are two possible  
fonts:

**pk** for the font which was originally used in the german magazine *Problemk-*  
*iste* ♔♚♛♜♝♞♟♠♡♢♣♤♥♦♧♨♩

**fs** for the font which was first used (and was created for) the magazine *feen-*  
*schach* ♔♚♛♜♝♞♟♠♡♢♣♤♥♦♧♨♩

`\diagramx`  
`\diagramxi`  
`\diagramxii` In analogy to the defaults for font sizes of a document you may specify sizes  
of the fonts used in a diagram. The default will be set according to the font size  
specified as the `\documentclass` option.

### 1.2.3 Other commands

- `\label`
  - This overrides the normal `\label` definition such that the diagram number is displayed when using `\ref` instead of the page number.
- `\diagnum`
  - This macro expects a number as a parameter. The number will be used to (re-)initialize the diagram number counter. With this command the output of diagram numbers also is switched on. It must be used outside the `diagram` environment. As an optional parameter you may specify something, which will be used as prefix before the automatically updated diagram numbers. E. g. the command `\diagnum[T-]{4}` will produce the following diagram numbers for the following diagrams: **T-4**, **T-5**, **T-6**, ...

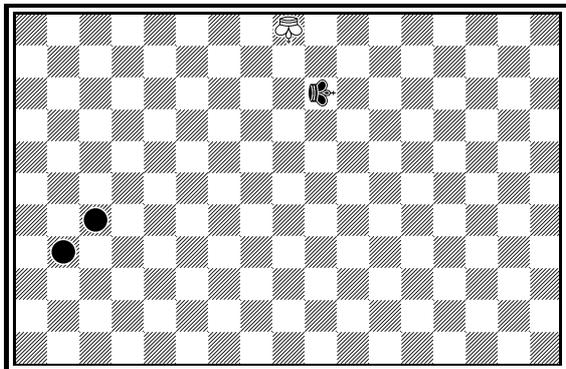
## 1.3 Special boards

### 1.3.1 Changing the boardsize

`diagram[]` Instead of using a boardsize of  $8 \times 8$  some fairy problems need smaller or larger

boards. This can be achieved by specifying the rows and columns as an optional parameter to the `\begin{diagram}` environment. You first have to specify the columns and then the rows as the following examples shows.

3



is created by

```
\begin{diagram}[17x11]
\label{bigdia}
\pieces{wKUi{11}, sKRj9, sCc5b4}
\end{diagram}
```

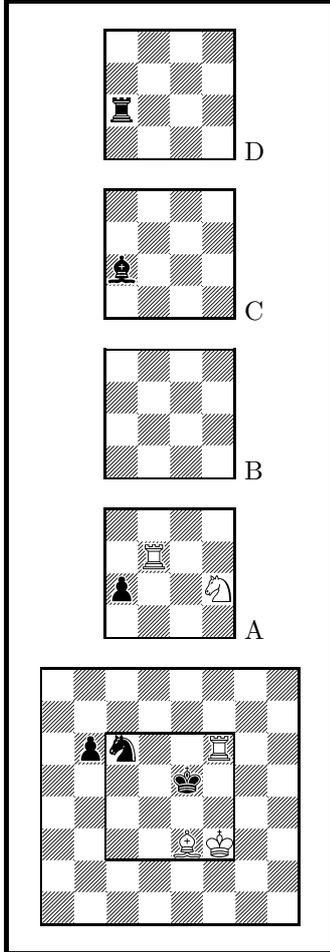
As you can see in the example, pieces are set using the `\pieces` macro. When using boards with more than 8 lines you have to continue with characters **i**, **j**, **k**, ... In a board with more than 9 rows you have to specify the rows in curly braces `{ }` as shown in the example.

### 1.3.2 Stereo- and Space-Chess-Diagrams

`stereodiagram`  
`spacediagram[]`

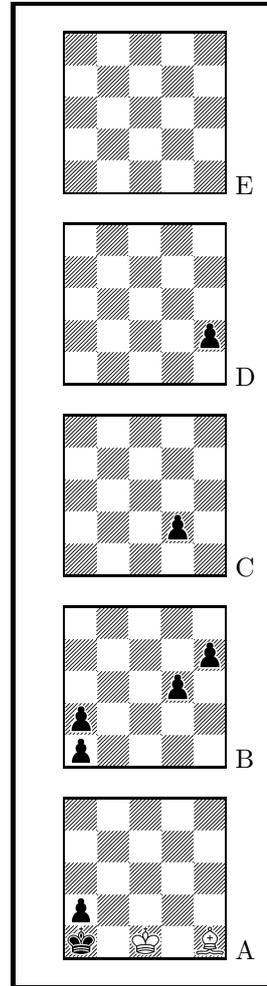
Other boards which are used from time to time are stereo chess or space chess boards (although there are quite few people which really have such boards!). To create these boards you just have to use either the `stereodiagram` or `spacediagram` environment instead of the normal `diagram` environment. Here is an example:

4  
 Gerhard W. Jensch  
 3104. feenschach 1980  
 Preis



#9 C- (5+6)

5  
 T. R. Dawson  
 6595. Fairy Chess  
 Review 12/1945



#2 C- (2+8)

These diagrams have been produced by the following code:

```

\begin{stereodiagram}
\author{Jensch, Gerhard W.}
\source{3104.}
\source{feenschach}
\year{1980}
\award{Preis}
\pieces{wKf3, wTf6d5A, wLe3, wSf4A, sKe5, sTc4D, sLc4C, sSc6, sBb6c4A}
\stip{\#9}
\end{stereodiagram}
\hfill
\begin{spacediagram}
\author{Dawson, T. R.}
\source{6595.}

```

```

\source{Fairy Chess Review}
\month{12}
\year{1945}
\pieces{wKc1A, wLe1A, sKa1A, sBa2Aa1Ba2Bd3Be4Bd2Ce2D}
\stip{\#2}
\end{spacediagram}

```

The main change is within the notation of the pieces, but people knowing space- or stereo-chess problems see that the notation is just one would expect.

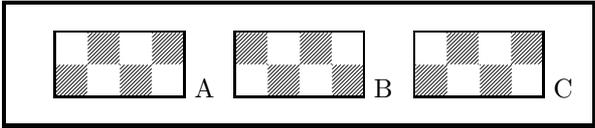
`\spacelayout` Sometimes one would like show the different planes of a space diagram from left to right. This may be switched using the `\spacelayout` command, which takes one parameter:

**vertical** for planes organized bottom up

**horizontal** for planes organized left to right

Is produced by

6



```

\begin{spacediagram}[4x2x3]
\spacelayout{horizontal}
\end{spacediagram}

```

C- (0+0)

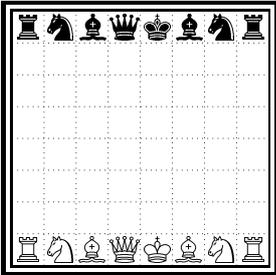
### 1.3.3 Cylindric boards / suppressing frames

`\horizontalcylinder` To stylize a cylindric board one typically does not show parts of the frame. `\verticalcylinder` When using `\verticalcylinder` the horizontal lines of the outer frame will not be drawn. `\horizontalcylinder` suppresses the drawing of the vertical lines of the outer frame. Using `\noframe` completely suppresses the outer frame. `\noinnerframe` suppresses the innerframe. In case of stereo- or space-chess-diagrams `\verticalcylinder`, `\horizontalcylinder` and `\noframe` suppresses the inner frame.

## 1.4 Change the coloring of the fields

`\allwhite` The `allwhite` boolean can be used to have all white squares. Therefore dotted lines are produced to separate the squares. For convenience we provide a command `allwhite` which switches the value of the `allwhite` boolean to true.

7



C- (8+8)

This was produced by:

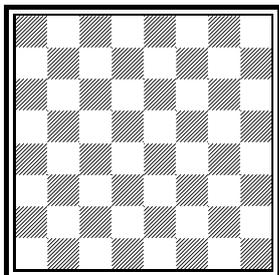
```

\begin{diagram}
\allwhite
\pieces{wKe1, wDd1, wTah1, wLf1c1, wSb1g1, %
sKe8, sDd8, sTa8h8, sLf8c8, sSb8g8}
\end{diagram}

```

`\switchcolors` The boolean `switchcolors` may be used to switch the coloring of white and black fields. For convenience we provide a command `switchcolors` which switches the value of the `switchcolors` boolean to true.

8



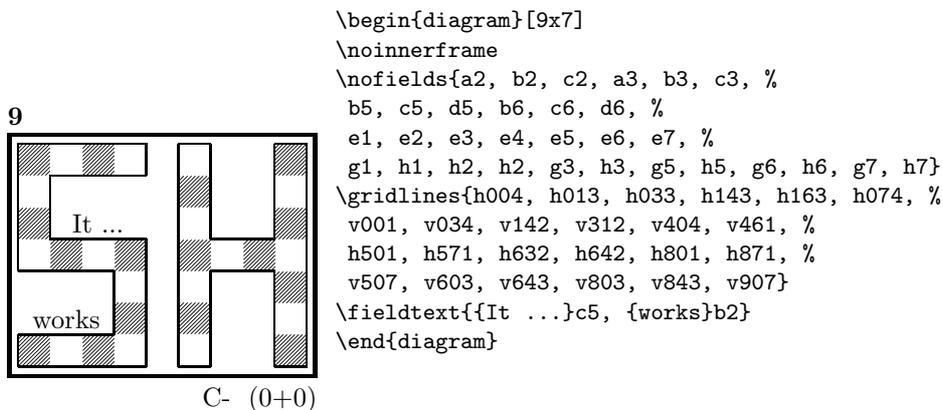
C- (0+0)

#### 1.4.1 figurine Notation

`figurine` Instead of using the `diagram`, `stereodiagram` or `spacediagram` environment one may use the `figurine` environment. This suppresses the diagram output and produces a figurine notation inside the current text.

#### 1.4.2 Changes within the board

- `\nofields` You may remove single fields by using the `\nofields` or `\nosquares` command.
- `\nosquares` Using this command does make sense for empty black fields only. This command expects a list of squares separated by “;”. You may also use this command within a stereo- or space-diagram. In this case you must specify the fields the same way you do it inside the `\pieces` command.
- `\fieldframe` You may specify single fields, which should be surrounded by a frame. This is possible using the `\fieldframe` command. You must specify the list of fields which should have frames the same way you specify fields within the `\nofields` command.
- `\gridlines` A more general form of lines within diagrams is possible by using the `\gridlines` command. You may specify a list of horizontal or vertical lines within the diagram. Different lines should be separated by “;”. A single line must be specified as:  
`[plane](v or h)(x-coordinate)(y-coordinate)(length in squares)`  
 You must specify a plane in case of stereo- or space-chess only. For a vertical line starting at the lower left corner of “c2” ending at the upper left corner of “c8” the command to use is: `\gridlines{v217}`. Concerning the coordinates and length specifications you should pay attention to put values greater 9 in curly braces { }.
- `\fieldtext` Sometimes you need to show text on some squares. This is done using the `\fieldtext` command. The syntax for a single text is: `{Text}(x-coordinate)(y-coordinate)`  
 Now an example how to use `\gridlines`, `\nofields` and `\fieldtext` to create some “*Letter-Board*” with text inside.



## 1.5 Misc

### 1.5.1 Chess pieces within normal text

Sometimes you may need symbols of chess pieces within your normal text, e. g. to show the *Viele-Väter-Stellung* ♔c8, ♙b6, ♘a8, ♚a7. This is possible by `{\wK}c8`, `{\wB}b6`, `{\sK}a8`, `{\sB}a7`. Additionally you may use some of these symbols:

- `\swL` ♖ a white bishop on a black square
- `\ssL` ♜ a black bishop on a black square
- `\wNr` ♞ a white nightrider
- `\nNr` ♞ a neutral nightrider
- `\sNr` ♞ a black nightrider
- `\wGh` ♟ a white grashopper
- `\nGh` ♟ a neutral grashopper
- `\sGh` ♟ a black grashopper
- `\Imi` ● an imitator, you may also use the **Circle** notation:
- `\wC` ○ a white circle
- `\nC` ◐ a neutral circle
- `\sC` ● a black circle
- `\wE` ♚ a white equihopper
- `\sE` ♚ a black equihopper
- `\nE` ♚ a neutral equihopper
- `\wX` ♚ a white rotated equihopper
- `\sX` ♚ a black rotated equihopper
- `\nX` ♚ a neutral rotated equihopper

### 1.5.2 Other often used symbols

The style also defines commands for other symbols, which are often used within the declaration of twins or when writing a solution:

<code>\set</code>	<code>*</code> setplay
<code>\ra</code>	$\rightarrow$ a left to right arrow
<code>\lra</code>	$\leftrightarrow$ a double ended arrow
<code>\00</code>	<b>0-0</b> king side castling
<code>\000</code>	<b>0-0-0</b> queen side castling
<code>\x</code>	$\times$ for “takes”
<code>\any</code>	$\sim$ for an arbitrary move (you must not simply use a $\sim$ within your text because T <sub>E</sub> X handles this as a protected space)
<code>arrowskip</code>	It is possible, to define a prefix and/or a suffix to use before and after arrows - typically a common separating space. Per default there is no such space. You may use the <code>arrowskip</code> environment have a common prefix and suffix before and after arrows: <pre>\begin{arrowskip}{a\,}{\,b} ... \end{arrowskip}</pre>

... will prefix arrows produced with `\ra` or `\lra` with `a\`, and suffix with `\,b`.

### 1.5.3 Internationalization

`\DefinePieces` This part is relevant for people who do not like the german notation for pieces and therefore want to change this within their sources. Using the german notation, you specify the color of a piece as **w**, **s** or **n**, the type of a piece as **K**, **D**, **T**, **L**, **S**, **B** and a possible rotation of a piece as **L**, **R** or **U**. To use another notation you may use the `\DefinePieces` command which takes 3 parameters.

1. the letters used to specify the colors of the pieces using the order white, black, neutral
2. the letters used to specify the type of a piece using the order king, queen, rook, bishop, knight, pawn. You may not use the characters **C**, **E** and **X**, because these are used for Circle, Equihopper and rotated Equihopper.
3. the letters used to specify an optional rotation using the order left-turned, right-turned, upside-down. You must use capital letters for this.

When using a `\DefinePieces` command, the commands are changed to its next usage (or to the end of the document). The command not only changes the pieces you may use within the `\pieces` command but also defines commands to be used within normal text, as the following example shows:

```
\DefinePieces{wbn}{KQREBNP}{LRU}  
\wDU\bKR\bwB  
creates 
```

### 1.5.4 When writing books

`\develop` To simplify your writings you may use the macro `\develop`. This will create the following additional information during development:

- when you use `\label` in your diagrams the label will be shown at the left upper corner of the diagram.
- The given label will also be shown inside the solution and also in any register entry.
- when you have specified a `\judgement` this information will be put into the solution.

Most books on chessproblems contain registers for authors, sometimes also on themes and sources. As you already collect all these information very detailed within the `diagram` environment the generation of registers is very simple.

`\makeaindex` To create a registers of authors you need to put the `\makeaindex` command  
`\authorindex` inside the preamble of your document. This instructs latex to write an intermediate file containing information about authors and the numbers of the diagrams.<sup>1</sup> After a first L<sup>A</sup>T<sub>E</sub>X run on your document, you need to convert the intermediate file. This may be done with the `makeindex` program, which will typically called like

```
makeindex -o <filename>.and <filename>.adx
```

The resulting register may be put into your document using the `\authorindex` command.

`\makesindex` Like an index for authors you may also create indices for sources and/or  
`\sourceindex` themes. For an source register you need to put `\makesindex` into your document  
`\maketindex` preamble; for a theme register the command is `\maketindex`. The conversion  
`\themeindex` commands for the intermediate files are

```
makeindex -o <filename>.snd <filename>.sdx
```

for the source register and

```
makeindex -o <filename>.tnd <filename>.tdx
```

for the theme register.

The source register is inserted into the text using `\sourceindex` and the theme register using `\themeindex`.

### 1.5.5 Other useful stuff

`\solpar` In some environments — like `window` — the use of `\par` leads to unwanted effects. Therefore we use the command `\solpar` inside the definition of `\@dia@solution`, which is used to display a single solution when using `\putsol`. You may use `\renewcommand{\solpar}` to provide another definition of `\solpar` in such situations.

`\insidediagram` The problem information collected by some commands may be used in different places (author names will be shown above the diagram and at the beginning of solutions when output using `\putsol`). Therefore we need some special handling of e.g. footnotes, to avoid creating the footnotemarks multiple times. Such

---

<sup>1</sup>Normally registers contain page numbers but with chess problems normally people refer to the diagram numbers.

commands should be used within `\insidediagram` as shown by the following example:

```
\begin{diagram}
\author{Else\insidediagram{\footnotemark}, Someone}
\end{diagram}
```

## 2 The documentation driver

The following code will generate the documentation. Since it is the first piece of code in the file, the documentation can be obtained by simply processing the file with L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub>.

```
1 <*driver>
2 \documentclass[a4paper]{article}
3 \usepackage{doc}
4 \usepackage{diagram}
5 \EnableCrossrefs
6 \CodelineIndex
7 \RecordChanges
8 \begin{document}
9 \DocInput{diagram.dtx}
10 \end{document}
11 </driver>
```

## 3 The implementation of the style

Specifies the preamble of our style file.

```
12 <*style>
13 \ProvidesPackage{diagram}[2024/10/14]
```

`\DefaultDiagramSize` The `\DefaultDiagramSize` may be used in code to switch to the default diagram size. As this depends on the documents default font size we use the same option and execute `10pt` as default.

```
14 \newcommand*{\DefaultDiagramSize}{}
15 \DeclareOption{10pt}{\renewcommand*{\DefaultDiagramSize}{\diagramx}}
16 \DeclareOption{11pt}{\renewcommand*{\DefaultDiagramSize}{\diagramxi}}
17 \DeclareOption{12pt}{\renewcommand*{\DefaultDiagramSize}{\diagramxii}}
18 \ExecuteOptions{10pt}

19 \ProcessOptions
20 \AtBeginDocument{\DefaultDiagramSize}

21 \RequirePackage{ifthen}
22 \RequirePackage{calc}
23 \RequirePackage{pstricks}
```

Now we declare some constants to unify its usage within the style file.

```
24 \chardef\f@ur=4
25 \chardef@ight=8
26 \newcount\elchfont
27
```

```

28 \chardef\@pkelch=0
29 \chardef\@fselch=1
30
31 \newcount\dia@type
32
33 \newboolean{@textproblem}
34 \setboolean{@textproblem}{false}
35 \def\textproblem{\setboolean{@textproblem}{true}\let\@dia@stipulation=\relax}
36
37 \newboolean{@solafterdiagram}
38 \setboolean{@solafterdiagram}{false}
39 \def\solafterdiagram{\setboolean{@solafterdiagram}{true}\ignorespaces}
40
41 \newif\if@vframe\@vframetrue
42 \newif\if@hframe\@hframetrue
43 \newif\if@leaveOuter\@leaveOutertrue
44
45 \newif\if@shortform
46
47 \newif\ifspace@vertical
48 \def\spacehorizontal{\space@verticalfalse}
49
50 % \newif\ifdi@no
51 \newboolean{@cpd@numbering@global}
52 \newboolean{@cpd@numbering@local}
53 \newcounter{board@nr}
54 \renewcommand{\theboard@nr}{\thediag}
55 % \newif\iffgcnt
56 \newboolean{piececounter}
57 \newcount\r@w
58 \newcount\lin@
59 \newcount\pl@ne
60 \newcount\current@plane
61
62 \newcount\w@cnt
63 \newcount\b@cnt
64 \newcount\n@cnt
65 \newboolean{showcity}
66 \setboolean{showcity}{false}
67 \newboolean{showacademictitle}
68 \setboolean{showacademictitle}{true}
69 \newboolean{legend}
70 \setboolean{legend}{false}
71
72 \newcount\@blackfield
73 \newboolean{allwhite}
74 \setboolean{allwhite}{false}
75 \newcommand{\allwhite}{\setboolean{allwhite}{true}}
76 \newcounter{field@border}
77 \newcount\@whitefield
78 \newboolean{switchcolors}
79 \setboolean{switchcolors}{false}
80 \newcommand{\switchcolors}{\setboolean{switchcolors}{true}}

```

We have counters for each color to count the pieces on the board.

```
81 \newboolean{cpd@checkPieceCounts}
82 \newcounter{cpd@defWhitePieces}
83 \newcounter{cpd@defBlackPieces}
84 \newcounter{cpd@defNeutralPieces}
85
86 \newcounter{cpd@whitePieces}
87 \newcounter{cpd@blackPieces}
88 \newcounter{cpd@neutralPieces}
89
90 \newcounter{cpd@row}
91 \newcounter{cpd@line}
92
93 \newcommand{\cpd@stepcounterWhite}{\stepcounter{cpd@whitePieces}}
94 \newcommand{\cpd@stepcounterBlack}{\stepcounter{cpd@blackPieces}}
95 \newcommand{\cpd@stepcounterNeutral}{\stepcounter{cpd@neutralPieces}}
96 \global\let\cpd@stepcounterPieces\relax
97
98 \newcount\help@a
99 \newcount\help@b
100
101 \newbox\dia@box
102 \newbox\@cnt@box
103 \newdimen\@cnt@wd
104 \newbox\@stip@box
105
106 \newdimen\topdist\topdist\z@
107 \newbox\@test@box
108 \newdimen\@test@dimen
109 \newif\if@left
110
111 \newcount\brd@ff
112
113 \newdimen\dia@lineskip
114
115 \newdimen\board@width
116 \newdimen\bd@width
117 \newdimen\head@width
118 \newdimen\sq@width
119
120 \newdimen\grid@width
121 \newdimen\inner@frame
122 \newdimen\outer@frame
123 \newdimen\space@frame
124 \newdimen\v@frame@dist
125 \newdimen\h@frame@dist
126 \newdimen\space@frame@dist
127 \newdimen\v@space@dist
128 \newdimen\h@space@dist
129
130 \newbox\sq@box
131 \newbox\plane@box
```

We need a lot of token registers to register the information from within

the `diagram` environment. These token registers are defined here. Initially each token register is defined to contain `\relax`, which serves as an *end-marker* when parsing lists.

```

132 \newtoks\typis@tk\typis@tk={\relax}
133 \newtoks\label@tk\label@tk={\relax}
134 \newtoks\sol@tk\sol@tk={\relax}
135 \newtoks\number@tk\number@tk={\relax}
136 \newtoks\aut@tk\aut@tk={\relax}
137 \newtoks\city@tk\city@tk={\relax}
138 \newtoks\sourcetr@tk\sourcetr@tk={\relax}
139 \newtoks\source@tk\source@tk={\relax}
140 \newtoks\day@tk\day@tk={\relax}
141 \newcount\from@month\from@month=\z@
142 \newcount\to@month\to@month=\z@
143 \newtoks\year@tk\year@tk={\relax}
144 \newtoks\issue@tk\issue@tk={\relax}
145 \newtoks\pages@tk\pages@tk={\relax}
146 \newtoks\tournament@tk\tournament@tk={\relax}
147 \newtoks\award@tk\award@tk={\relax}
148 \newtoks\after@tk\after@tk={\relax}
149 \newtoks\version@tk\version@tk={\relax}
150 \newtoks\correction@tk\correction@tk={\relax}
151 \newtoks\dedic@tk\dedic@tk={\relax}
152 \newtoks\fidealb@tk\fidealb@tk={\relax}
153 \newtoks\theme@tk\theme@tk={\relax}
154 \newtoks\twins@tk\twins@tk={\relax}
155 \newtoks\judgement@tk\judgement@tk={\relax}
156 \newtoks\comment@tk\comment@tk={\relax}
157 \newtoks\computer@tk\computer@tk={-}
158 \newtoks\nofields@tk\nofields@tk={\relax}
159 \newtoks\fieldframe@tk\fieldframe@tk={\relax}
160 \newtoks\gridlines@tk\gridlines@tk={\relax}
161 \newtoks\pieces@tk\pieces@tk={\relax}
162 \newtoks\fen@tk\fen@tk={\relax}
163 \newtoks\fieldtext@tk\fieldtext@tk={\relax}
164 \newtoks\text@tk\text@tk={\relax}
165 \newtoks\stipulation@tk\stipulation@tk={\relax}
166 \newtoks\condition@tk\condition@tk={\relax}
167 \newtoks\remark@tk\remark@tk={\relax}
168 \newtoks\piecedefs@tk\piecedefs@tk={\relax}
169 \newtoks\@cpd@emptytest

```

To remember, which information has been specified, we define T<sub>E</sub>X-boolens for each command.

```

170 \newif\if@label\@labelfalse
171 \newif\if@number\@numberfalse
172 \newif\if@special\@specialfalse
173 \newif\if@auth@r\auth@rfalse
174 \newif\if@city\@cityfalse
175 \newif\if@sourcetr\@sourcetrfalse
176 \newif\if@source\@sourcefalse
177 \newif\if@date\@datefalse
178 \newif\if@day\@dayfalse
179 \newif\if@year\@yearfalse

```

```

180 \newif\if@issue\@issuefalse
181 \newif\if@pages\@pagesfalse
182 \newif\if@tournament\@tournamentfalse
183 \newif\if@award\@awardfalse
184 \newif\if@after\@afterfalse
185 \newif\if@version\@versionfalse
186 \newif\if@correction\@correctionfalse
187 \newif\if@dedication\@dedicationfalse
188 \newif\if@idealalbum\@idealalbumfalse
189 \newif\if@twins\@twinsfalse
190 \newif\if@theme\@themefalse
191 \newif\if@computer\@computerfalse
192 \newif\if@judgement\@judgementfalse
193 \newif\if@comment\@commentfalse
194 \newif\if@pieces\@piecesfalse
195 \newboolean{cpd@fen}\setboolean{cpd@fen}{false}%
196 \newif\if@fieldtext\@fieldtextfalse
197 \newif\if@nofields\@nofieldsfalse
198 \newif\if@gridlines\@gridlinesfalse
199 \newif\if@fieldframe\@fieldframefalse
200 \newif\if@stdgrid\@stdgridfalse
201 \newboolean{showcomputer}\setboolean{showcomputer}{true}%
202 \newcommand*{\computerproofedsymbol}{C+}
203 \newcommand*{\notcomputerproofedsymbol}{C-}
204 % \newif\if@show@computer\@show@computertrue
205 \newif\if@stipulation\@stipulationfalse
206 \newif\if@condition\@conditionfalse
207 \newif\if@remark\@remarkfalse
208 \newif\if@piecedefs\@piecedefsfalse
209 \newif\if@typis\@typisfalse
210 \newif\if@widedias\@widediasfalse
211 \newif\ifx@twins\x@twinsfalse
212 \newif\ifx@cond\x@condfalse
213 \newif\ifimitator\imitatorfalse
214 \newif\ifnormal@names\normal@namesfalse
215 \newif\ifs@lu
216 \newif\if@develop\@developfalse
217 \newif\if@notfirst
218 \newif\if@first

219 \newwrite\s@lfd
220 \let\below@newline=\relax
221 % These are used by the ‘old’ board creating mechanism
222 \newcount\@lines
223 \newcount\@rows
224 \newcount\lines@max
225 \newcount\rows@max
226 \newcount\planes@max

The following counters are used when creating the diagram itself.
227 \newcounter{cpd@rowsmax}
228 \newcounter{cpd@linesmax}
229 \newcounter{cpd@current@row}
230 \newcounter{cpd@current@line}
231 \newcounter{cpd@maxsquare}

```

```

232 \newcounter{cpd@helper}
233 \newcounter{cpd@current@square@index}
234 \newcounter{cpd@current@square@value}

```

Some boolean T<sub>E</sub>X-switches used within stereo- or spacechess diagrams.

```

235 \newif\if@stereo\@stereofalse
236 \newif\if@space\@spacefalse

```

These boolean switches are used to control the output of registers.

```

237 \newif\if@aindex\@aindexfalse
238 \newif\if@sindex\@sindexfalse
239 \newif\if@tindex\@tindexfalse
240 \newif\if@label

```

`\cpd@begindiagram@hook` We define hooks to be executed in `\begin{diagram}` and `\end{diagram}`.

```

\cpd@enddiagram@hook
241 \newcommand{\cpd@begindiagram@hook}{}
242 \newcommand{\cpd@enddiagram@hook}{}

```

`\diagram` Defines the code executed in `\begin{diagram}`. In case no optional size is given, `\@diagram` a normal 8×8 board is generated.

```

243 \def\diagram{%
244   \begingroup%
245   \ifnextchar [{\@diagram}{\@diagram[\@ight x\@ight]}%
246 }
247
248 \def\@cpd@initsize#1#2{%
249   \setcounter{cpd@linesmax}{#1}%
250   \setcounter{cpd@rowsmax}{#2}%
251   \setcounter{cpd@maxsquare}{\value{cpd@rowsmax}*\value{cpd@linesmax}}%
252 }
253
254 \def\@diagram[#1x#2]{%
255   \lines@max=#1%
256   \rows@max=#2%
257   \@cpd@initsize{#1}{#2}%
258   \plane=\z@%
259   \current@plane=\z@%
260   \let\put@sqs=\put@sqs@normal%
261   \let\read@plane=\read@plane@normal%
262   \@start@diagram%
263 }
264 \def\stereodiagram{%
265   \begingroup%
266   \inner@frame=0.6pt%
267   \@stereotrue%
268   \@cpd@initsize{8}{8}%
269   \let\put@sqs=\put@sqs@stereo%
270   \let\read@plane=\read@plane@stereo%
271   \@start@diagram%
272 }
273 \def\spacediagram{%
274   \begingroup%
275   \inner@frame=0.6pt%
276   \@spacetrue%

```

```

277 \@ifnextchar [{\@spacediagram}{\@spacediagram[5x5x5]}%
278 }
279
280 \def\@spacediagram[#1x#2x#3]{%
281 \lines@max=#1%
282 \rows@max=#2%
283 \planes@max=#3%
284 \@cpd@initsize{#1}{#2}%
285 \let\put@sqs=\put@sqs@space%
286 \let\read@plane=\read@plane@space%
287 \@start@diagram%
288 }
289 \def\@start@diagram{%
290 \init@vars%
291 \let\author=\ds@author%
292 \let\day=\ds@day%
293 \let\month=\ds@month%
294 \let\year=\ds@year%
295 \let\label=\ds@label%
296 \cpd@begindiagram@hook%
297 \ignorespaces%
298 }
299
300 \def\showtypis#1{%
301 \@typistrue%
302 \typis@tk={#1}%
303 \ignorespaces%
304 }
305
306
307 \newboolean{@cpd@inside@diagram}
308 \setboolean{@cpd@inside@diagram}{false}
309 \newcommand{\insidediagram}[1]{%
310 \ifthenelse{\boolean{@cpd@inside@diagram}}{#1}{}%
311 }
312 \def\enddiagram{%
313 \let\author=\orig@author%
314 \let\day=\orig@day%
315 \let\month=\orig@month%
316 \let\year=\orig@year%
317 \let\label=\orig@label%
318 \if@number%
319 \else%
320 \refstepcounter{board@nr}% so \label and \ref work properly
321 \fi%
322 %
323 % Now \label@tk should be set, if wanted, so
324 % we can generate the index entries
325 %
326 \@aindex%
327 \@sindex%
328 \@tindex%
329 %
330 % Now \@currentlabel will be set right, so we can use

```

```

331 % the original label
332 \if@label%
333     \expandafter\set@label\the\label@tk;%
334 \fi%
335 %
336 % Now we know, if we have frames so we can setup our dimensions
337 %
338 \global\squarewidth=\fontdimen\tw@\chessfont%
339 \if@stereo%
340     \bd@width=\@ight\squarewidth%
341     \board@width=\@ight\squarewidth%
342     \ifdim\h@frame@dist<\squarewidth%
343         \h@frame@dist=\squarewidth%
344     \fi%
345     % We do already skip with \v@space@dist
346     % So we use the additional skip \space@frame@dist here
347     \v@frame@dist=\space@frame@dist%
348     \ifdim\space@frame>\outer@frame%
349         \outer@frame=\space@frame%
350     \fi%
351     \advance\bd@width\tw@\inner@frame%
352     \advance\board@width\tw@\inner@frame%
353     \advance\board@width\tw@\h@frame@dist%
354     \advance\board@width\tw@\outer@frame%
355 \else\if@space%
356     \ifdim\h@frame@dist<1.5\squarewidth%
357         \h@frame@dist=1.5\squarewidth%
358     \fi%
359     % We do already skip with \v@space@dist
360     % So we use the additional skip \space@frame@dist here
361     \v@frame@dist=\space@frame@dist%
362     \ifdim\space@frame>\outer@frame%
363         \outer@frame=\space@frame%
364     \fi%
365     \ifspace@vertical%
366         \bd@width=\lines@max\squarewidth%
367         \board@width\bd@width%
368         \advance\bd@width\tw@\inner@frame%
369         \advance\board@width\tw@\inner@frame%
370         \advance\board@width\tw@\h@frame@dist%
371         \advance\board@width\tw@\outer@frame%
372     \else%
373         \bd@width=\lines@max\squarewidth%
374         \advance\bd@width\tw@\inner@frame%
375         \ifdim\h@space@dist<1.5\squarewidth%
376             \h@space@dist=1.5\squarewidth%
377         \fi%
378         %\h@space@dist=0.7\squarewidth%
379         % Now we can compute the width of the complete board
380         \board@width\bd@width%
381         \advance\board@width\h@space@dist%
382         \multiply\board@width\planes@max%
383         \advance\board@width\h@space@dist%
384         \advance\board@width\tw@\outer@frame%

```

```

385     \fi%
386 \else%
387   \ifthenelse{\boolean{legend}}{\v@frame@dist=1.5em\h@frame@dist=1.5em}{}%
388   \bd@width=\lines@max\sq@width%
389   \ifnum\lines@max>\@ight%
390     % Make the board wider
391     \board@width=\lines@max\sq@width%
392   \else%
393     % Make a normal width
394     \board@width=\@ight\sq@width%
395   \fi%
396   \advance\bd@width\tw@\inner@frame%
397   \advance\board@width\tw@\inner@frame%
398   \advance\board@width\tw@\h@frame@dist%
399   \advance\board@width\tw@\outer@frame%
400 \fi\fi%
401 \if@widedias%
402   \head@width=\textwidth%
403 \else%
404   \head@width=\board@width%
405 \fi%
406 %
407 % Now we should build the diagram itself
408 %
409 \ifthenelse{\boolean{@textproblem}}{%
410   % Put the stipulation into the \sq@box
411   \setbox\sq@box=\hbox{\vbox to \board@width{\hspace\board@width%
412     \stipfont%
413     \raggedright%
414     \sloppy%
415     \the\stipulation@tk%
416     \vfil%
417   }}%
418 }{%
419   \put@sq% This builds up the \sq@box
420   % Check, if the given number of pieces is reached
421   \ifthenelse{\boolean{cpd@checkPieceCounts}}{%
422     \ifthenelse{\value{cpd@defWhitePieces}=\value{cpd@whitePieces}}{%
423       {\errmessage{Wrong number of white pieces}}%
424     \ifthenelse{\value{cpd@defBlackPieces}=\value{cpd@blackPieces}}{%
425       {\errmessage{Wrong number of black pieces}}%
426     \ifthenelse{\value{cpd@defNeutralPieces}=\value{cpd@neutralPieces}}{%
427       {\errmessage{Wrong number of neutral pieces}}%
428     }{}%
429   }%
430 %
431 \global\setbox\dia@box=\hbox{\vbox{%
432   \setboolean{@cpd@inside@diagram}{true}%
433   \parindent\z@%
434   \parskip\z@%
435   \baselineskip11\p@\advance\baselineskip\dia@lineskip%
436   \hspace\head@width%
437   \centering%
438   % diagram header

```

```

439     \vskip\topdist%
440     \vbox{\hsize\board@width\hbox{%
441         \if@develop\if@label%
442             \noindent\raggedright\llap{\labelfont\the\label@tk\ }%
443         \fi\fi%
444         \vbox{%
445             \he@dpos\dia@above%
446         }%
447     }}%
448     \vskip\tw@p%
449     % diagram itself
450     \vtop{\hsize\board@width%
451         \hbox to \head@width{\hss\vbox{%
452             \hsize\board@width%
453             \ifthenelse{\boolean{@textproblem}}{%
454                 \box\sq@box%
455             }{%
456                 \outer@henbox{\box\sq@box}%
457             }%
458         }\hss}%
459     % diagram trailer
460     \hbox to \head@width{\hss\vtop{%
461         \hsize\board@width%
462         \parskip\z@%
463         \raggedright%
464         \put@count%
465         \dia@below%
466     }\hss}%
467     }%
468     \setboolean{@cpd@inside@diagram}{false}%
469 }}% End of \dia@box
470 \do@dia@job%
471 \cpd@enddiagram@hook%
472 \endgroup%
473 }
474
475 \def\do@put@count{%
476     \ \ (\arabic{cpd@whitePieces}+\arabic{cpd@blackPieces}%
477     \ifthenelse{\value{cpd@neutralPieces}>0}{+\arabic{cpd@neutralPieces}}{}}%
478 }
479
480 \def\put@count{%
481     % First we build the box with the figure count
482     \ifthenelse{\boolean{showcomputer}\OR\boolean{piececounter}}{%
483         \global\setbox\@cnt@box=\hbox{%
484             \stipfont%
485             \ifthenelse{\boolean{showcomputer}}{%
486                 \ \ \if@computer\computerproofedsymbol\else\notcomputerproofedsymbol\fi%
487             }{}%
488             \ifthenelse{\boolean{piececounter}}{%
489                 \do@put@count%
490             }{}%
491         }%
492         \@cnt@wd=\wd\@cnt@box%

```

```

493     \hangindent-\@cnt@wd%
494     \hangafter\m@ne%
495     \noindent%
496     \hbox to \z@{%
497         \hbox to \board@width{\hfil\unhbox\@cnt@box}\hskip -\board@width%
498     }%
499 }{}%
500 }
501
502 \let\endstereodiagram=\enddiagram
503 \let\endspacediagram=\enddiagram
504 \def\figurine{%
505     \begingroup%
506     \init@vars%
507     \let\author=\ds@author%
508     \let\day=\ds@day%
509     \let\month=\ds@month%
510     \let\year=\ds@year%
511     \let\label=\ds@label%
512     \cpd@begindiagram@hook%
513 }
514
515 \def\endfigurine{%
516     \let\author=\orig@author%
517     \let\day=\orig@day%
518     \let\month=\orig@month%
519     \let\year=\orig@year%
520     \let\label=\orig@label%
521     \if@number%
522     \else%
523         \refstepcounter{board@nr}% so \label and \ref work properly
524     \fi%
525     %
526     % Now \label@tk should be set, if wanted, so
527     % we can generate the index entries
528     %
529     \@aindex%
530     \@sindex%
531     \@tindex%
532     %
533     % Now \@currentlabel will be set right, so we can use
534     % the original label
535     %
536     \if@label%
537         \expandafter\@set@label\the\label@tk;%
538     \fi%
539     %
540     \@show@figurine%
541     \cpd@enddiagram@hook%
542     \endgroup%
543 }
544 %
545 \gdef\selectelchfont#1{%
546     \global\elchfont\csname @#1elch\endcsname\defaultelchfont%

```

547 }

Here we define commands to change fonts used for text above and below the diagram. You may redefine to adjust the fonts to your needs.

```
\authorfont
\cityfont 548 \newcommand*{\authorfont}{\bfseries}
\sourcefont 549 \newcommand*{\cityfont}{\slshape}
\awardfont 550 \newcommand*{\sourcefont}{\bfseries\itshape}
\dedicfont 551 \newcommand*{\awardfont}{\itshape}
\stipfont 552 \newcommand*{\dedicfont}{\itshape}
\remfont 553 \newcommand*{\stipfont}{\rmfamily}
\labelfont 554 \newcommand*{\remfont}{\rmfamily}
\cpd@boardfont 555 \newcommand*{\labelfont}{\rmfamily}
\legendfont 556 \newcommand*{\cpd@boardfont}{\rmfamily}
557 \newcommand*{\legendfont}{\sffamily}
```

We have three different default sizes for diagrams. The following commands switch fontsizes used for the chessfonts to typeset the diagrams.

```
\diagramx
\diagramxi 558 \newcommand*{\diagramx}{
\diagramxii 559 \ifcase\elchfont\relax%
560 \font\chessfont=pkelch12
561 \font\chtextfont=pkelch10
562 \else%
563 \font\chessfont=fselch12
564 \font\chtextfont=fselch10
565 \fi%
566 \dia@lineskip\z@
567 \dia@type\z@
568 }
569
570 \newcommand*{\diagramxi}{
571 \ifcase\elchfont\relax%
572 \font\chessfont=pkelch14
573 \font\chtextfont=pkelch11
574 \else%
575 \font\chessfont=fselch14
576 \font\chtextfont=fselch11
577 \fi%
578 \dia@lineskip\@ne\p@
579 \dia@type\@ne
580 }
581
582 \newcommand*{\diagramxii}{
583 \ifcase\elchfont\relax%
584 \font\chessfont=pkelch16
585 \font\chtextfont=pkelch12
586 \else%
587 \font\chessfont=fselch16
588 \font\chtextfont=fselch12
589 \fi%
590 \dia@lineskip\tw@\p@
591 \dia@type\tw@
```

592 }

`\defaultelchfont` `\defaultelchfont` is used to define the fontsize used to typeset the diagrams depending on the documentsize.

```
593 \def\defaultelchfont{%
594   \ifcase\@ptsize\relax%
595     \diagramx\or%
596     \diagramxi\or%
597     \diagramxii%
598   \fi%
599 }
```

```
600 \def\dianamestyle#1{\def\@dianame{\csname @#1\endcsname}}
601 \def\solnamestyle#1{\def\@solname{\csname @#1\endcsname}}
602 \newcommand*\@diagramnum}[2][ ]{%
603   \renewcommand*\@dianumber@prefix}{#1}%
604   \setcounter{board@nr}{#2}%
605   \addtocounter{board@nr}{\m@ne}}
```

Now we define a couple of abbreviations and special symbols often used when setting problem chess documents.

`\ra` Arrows and specification of space (or something different) before and after arrows.  
`\lra` rows.

```
\rla 606 \newcommand{\@cpd@pre@arrow}{ }
arrowskip 607 \newcommand{\@cpd@post@arrow}{ }
608 \newcommand{\ra}{\@cpd@pre@arrow\mbox{$\rightarrow$}\@cpd@post@arrow}
609 \newcommand{\lra}{\@cpd@pre@arrow\mbox{$\leftrightarrow$}\@cpd@post@arrow}
610 \let\rla=\lra
611 \newcommand*\@cpd@prepost@arrow}[2]{%
612   \renewcommand*\@cpd@pre@arrow}{#1}
613   \renewcommand*\@cpd@post@arrow}{#2}
614 }
615 \newenvironment{arrowskip}{%
616   \@cpd@prepost@arrow%
617 }{%
618 }
```

```
\x
\set 619 \newcommand{\x}{\mbox{\ifmmode\times\else$\times$\fi}}
\OO 620 \def\set{\kern -.05em\raise .1ex\hbox{*}}
\OOO 621 \def\OO{0\raise.25ex\hbox{-}\kern -.1em\relax}
\any 622 \def\OO{\@OO}
\further 623 \def\OOO{\@OO\@OO}
624 \def\any{\ifmmode\sim\else$\sim$\fi}
625 \def\further{\ifmmode\Rightarrow\else$\Rightarrow$\fi \ignorespaces}

626 \def\spacelayout#1{\csname space@#1\endcsname}
627 \def\nodiagnumbering{%
628   % \global\di@nofalse
629   \setboolean{@cpd@numbering@global}{false}
630 }
631 \newcommand*\@dianumber@prefix}{ }
632 \def\diagnumbering#1{%
```

```

633 \setboolean{cpd@numbering@global}{true}%
634 % \global\di@notrue%
635 \diagnum{#1}%
636 \gdef\thediag{\@dianumber@prefix\csname @#1\endcsname\c@board@nr}%
637 }

```

`\diagcenter` The macros `\diagcenter`, `\diagleft` and `\diagright` simply define the macro `\he@dpos` to the corresponding paragraph alignment.

```

\diagleft \he@dpos{\centering}
\diagright 638 \def\diagcenter{\def\he@dpos{\centering}}
639 \def\diagleft{\def\he@dpos{\raggedright}}
640 \def\diagright{\def\he@dpos{\raggedleft}}

```

`\setmonthstyle` The implementation of `\setmonthstyle` does `\diagnumbering` define a command which uses the given parameter as a part of the command name.

```

641 \def\setmonthstyle#1{\def\write@month{\csname @#1\endcsname}}

642 \def\specialdiagnum#1{%
643 \ifthenelse{equal{#1}}{%
644 % We disable displaying the diagram number
645 \setboolean{cpd@numbering@local}{false}%
646 }{%
647 \setboolean{cpd@numbering@local}{true}%
648 \@specialtrue%
649 }
650 \number@tk={#1}\@numbertrue%
651 \def\thediag{#1}\def\@currentlabel{#1}%
652 \ignorespaces%
653 }

```

`\ds@label` The macros `\ds@label` and `\ds@author` are defined internally and are made public within `\begin{diagram}`. This is because the macros `\label` and `\author` are normal L<sup>A</sup>T<sub>E</sub>X-macros and I want to avoid to redefine these globally.

```

654 \def\ds@label{%
655 \@ifstar{\ds@labelfalse\ds@xlabel}{\ds@labeltrue\ds@xlabel}%
656 }
657 \def\ds@author#1{%
658 \aut@tk={#1}\auth@rtrue%
659 \ignorespaces%
660 }

```

`\ds@academictitle`

```

\Dr 661 \def\ds@academictitle#1{\ifthenelse{boolean{showacademictitle}}{#1~}{\ignorespaces}
\Prof 662 \newcommand{\Dr}{\ds@academictitle{Dr.}}
\ProfDr 663 \newcommand{\Prof}{\ds@academictitle{Prof.}}
664 \newcommand{\ProfDr}{\ds@academictitle{Prof. \,Dr.}}

665 \def\@cpd@warnIfEmpty#1#2{%
666 \begingroup%
667 \@cpd@emptytest={#1}%
668 \edef\@cpd@param{the\@cpd@emptytest}%
669 \expandafter\endgroup%
670 \ifx\@cpd@param@empty\relax%
671 \message{^^JWARNING: empty '#2' argument.^^J}%
672 \fi

```

```

673 }
674 \def\city#1{%
675   \city@tk={#1}\@citytrue%
676   \ignorespaces%
677 }
678 \def\sourcenr#1{%
679   \sourcenr@tk={#1}\@sourcenrtrue%
680   \ignorespaces%
681 }
682 \def\source#1{%
683   \source@tk={#1}\@sourcetrue%
684   \ignorespaces%
685 }
686 \def\ds@day#1{%
687   \day@tk={#1}\@daytrue\@datetrue%
688   \ignorespaces%
689 }
690 \def\ds@month#1{%
691   \from@month=#1\@datetrue%
692   \ignorespaces%
693 }
694 \def\months#1{%
695   \@months#1;%
696   \ignorespaces%
697 }
698 \def\ds@year#1{%
699   \year@tk={#1}\@yeartrue\@datetrue%
700   \ignorespaces%
701 }
702 \def\issue#1{%
703   \issue@tk={#1}\@issuetrue%
704   \ignorespaces%
705 }
706 \def\pages#1{%
707   \pages@tk={#1}\@pagetrue%
708   \ignorespaces%
709 }
710 \def\tournament#1{%
711   \tournament@tk={#1}\@tournamenttrue%
712   \ignorespaces%
713 }
714 \def\award#1{%
715   \@cpd@warnIfEmpty{#1}{award}%
716   \award@tk={#1}\@awardtrue%
717   \ignorespaces%
718 }
719 \def\version#1{%
720   \@cpd@warnIfEmpty{#1}{version}%
721   \version@tk={#1}\@versiontrue%
722   \ignorespaces%
723 }
724 \def\after#1{%
725   \@cpd@warnIfEmpty{#1}{after}%
726   \after@tk={#1}\@aftertrue%

```

```

727 \ignorespaces%
728 }
729 \def\correction#1{%
730 \@cpd@warnIfEmpty{#1}{correction}%
731 \correction@tk={#1}\@correctiontrue%
732 \ignorespaces%
733 }
734 \def\dedication#1{%
735 \@cpd@warnIfEmpty{#1}{dedication}%
736 \dedic@tk={#1}\@dedicationtrue%
737 \ignorespaces%
738 }
739 \def\fidealalbum#1{%
740 \fidealalbum@tk={#1}\@fidealalbumtrue%
741 \ignorespaces%
742 }
743 \def\pieces{%
744 \@ifnextchar[%
745 {\x@pieces}%
746 {\@pieces}%
747 }
748 \def\x@pieces[#1]{%
749 % We should parse the given piececounts
750 \setboolean{cpd@checkPieceCounts}{true}%
751 \@parseWhiteAndBlackCount#1+\e@list
752 \@pieces%
753 }
754 \def\@parseWhiteAndBlackCount#1+#2+{%
755 \setcounter{cpd@defWhitePieces}{#1}%
756 \setcounter{cpd@defBlackPieces}{#2}%
757 \futurelet\n@xt\cpd@checkNeutral%
758 }
759 \let\cpd@nextproc=\relax%
760 \def\cpd@checkNeutral{%
761 \if\n@xt\relax%
762 \let\cpd@nextproc=\relax%
763 \else%
764 \let\cpd@nextproc=\@parseNeutralCount%
765 \fi%
766 \cpd@nextproc%
767 }
768 \def\@parseNeutralCount#1+{%
769 \setcounter{cpd@defNeutralPieces}{#1}%
770 }
771 \def\@pieces#1{%
772 \pieces@tk={#1}\@piecestrue%
773 \ignorespaces%
774 }
775 \newcommand{\fen}[2][ ]{%
776 \ifthenelse{equal{#1}{}}{%
777 {}% Do nothing
778 {}%
779 \setboolean{cpd@checkPieceCounts}{true}%
780 \@parseWhiteAndBlackCount#1+\e@list

```

```

781     }%
782   \fen@tk={#2}\setboolean{cpd@fen}{true}%
783   \ignorespaces%
784 }
785 \def\fieldtext#1{%
786   \fieldtext@tk={#1}\@fieldtexttrue%
787   \ignorespaces%
788 }
789 \def\nofields#1{%
790   \nofields@tk={#1}\@nofieldstrue%
791   \ignorespaces%
792 }
793 \let\nosquares\nofields
794 \def\gridlines#1{%
795   \gridlines@tk={#1}\@gridlinestrue%
796   \ignorespaces%
797 }
798 \def\fieldframe#1{%
799   \fieldframe@tk={#1}\@fieldframetrue%
800   \ignorespaces%
801 }
802 \def\stipulation#1{%
803   \stipulation@tk={#1}\@stipulationtrue%
804   \ignorespaces%
805 }
806 \def\condition{%
807   \ifstar{\x@condtrue\@condition}{\@condition}%
808 }
809 \def\@condition#1{%
810   \condition@tk={#1}\@conditiontrue%
811   \ignorespaces%
812 }
813 \def\twins{%
814   \ifstar{\x@twinstrue\@twins}{\@twins}%
815 }
816 \def\@twins#1{%
817   \twins@tk={#1}\@twinstrue%
818   \ignorespaces%
819 }
820 \def\remark#1{%
821   \remark@tk={#1}\@remarktrue%
822   \ignorespaces%
823 }
824 \def\piecedefs#1{%
825   \piecedefs@tk={#1}\@piecedefstrue%
826   \ignorespaces%
827 }
828 % \def\@piecedef#1{\csname#1\endcsname\l@klist}
829 % \newcommand{\piecedef}[3][ws]{%
830 %   \def\x@piecedef{#2}%
831 %   \let\@action=\@piecedef%
832 %   \hbox{\l@klist#1\@list%
833 %     \ = #3}%
834 % }

```

```

835 \def\Co#1{%
836   \ifx#1+\@computertrue\computer@tk={+}\fi%
837   \ignorespaces%
838 }
839 \long\def\solution#1{%
840   \sol@tk={#1}\global\s@luttrue%
841   \ignorespaces%
842 }
843 \def\themes#1{%
844   \theme@tk={#1}\@themetrue%
845   \ignorespaces%
846 }
847 \def\genre#1{%
848   \relax% Currently not used within diagram.sty
849 }
850 \long\def\comment#1{%
851   \comment@tk={#1}\@commenttrue%
852   \ignorespaces%
853 }
854 \long\def\judgement#1{%
855   \judgement@tk={#1}\@judgementtrue%
856   \ignorespaces%
857 }
858 \def\noframe{%
859   \@vframefalse\@hframefalse%
860   \ignorespaces%
861 }
862 \def\noinnerframe{%
863   \@leaveOuterfalse\@vframefalse\@hframefalse%
864   \ignorespaces%
865 }
866 \def\verticalcylinder{%
867   \@vframefalse%
868   \ignorespaces%
869 }
870 \def\horizontalcylinder{%
871   \@hframefalse%
872   \ignorespaces%
873 }
874 \def\stdgrid{%
875   \@stdgridtrue%
876   \ignorespaces%
877 }

```

`\gridchess` Here we define some abbreviations and synonyms for other macros.

```

\magic 878 \let\gridchess=\stdgrid
\tourn 879 \let\magic=\fieldframe
\dedic 880 \let\tourn=\tournament
\stip 881 \let\dedic=\dedication
\cond 882 \let\stip=\stipulation
\rem 883 \let\cond=\condition
\sol 884 \let\rem=\remark
885 \let\sol=\solution

```

```

886 \def\develop{%
887   \@developtrue%
888   \ignorespaces%
889 }
890 \def\showcomputer{%
891   \setboolean{showcomputer}{true}%
892   \ignorespaces%
893 }
894 \def\nocomputer{%
895   \setboolean{showcomputer}{false}%
896   \ignorespaces%
897 }
898 \def\putsol{\immediate\closeout\s@lfd\input\jobname.sol\cl@arsol}
899 \def\widedias{\@widediastrue\diagcenter}
900 \def\nowidedias{\@widediasfalse}
901 \def\normalnames{\normal@namestrue}
902 \def\reversednames{\normal@namesfalse}
903 \def\makeaindex{%
904   \@dia@index%
905   \newindex[thediag]{author}{adx}{and}{Autorenverzeichnis}%
906   \@aindextrue\reversednames%
907 }
908
909 \def\makesindex{%
910   \@dia@index%
911   \newindex[thediag]{source}{sdx}{snd}{Quellenregister}%
912   \@sindextrue%
913 }
914
915 \def\maketindex{%
916   \@dia@index%
917   \newindex[thediag]{theme}{tdx}{tnd}{Themenregister}%
918   \@tindextrue%
919 }
920
921 \def\authorindex{\let\@idxitem\@aidxitem\printindex[author]}
922 \def\sourceindex{\printindex[source]}
923 \def\themeindex{\printindex[theme]}
924 \def\DefinePieces#1#2#3{%
925   \@setPieceColor#1\@setPieceSpec#2\@setPieceRotation#3%
926   \loop@rotation%
927   \expandafter\xdef\csname\ds@black\ds@white\ds@bishop\endcsname{%
928     \noexpand\ch@fig{20}%
929   }%
930   \expandafter\xdef\csname\ds@black\ds@black\ds@bishop\endcsname{%
931     \noexpand\ch@fig{32}%
932   }%
933   \expandafter\xdef\csname\ds@white F\endcsname{\chessfont\ }
934   \expandafter\xdef\csname\ds@black F\endcsname{\chessfont\char144}
935   \expandafter\xdef\csname\ds@white Nr\endcsname{%
936     \noexpand\ch@fig{109}%
937   }%
938   \expandafter\xdef\csname\ds@neutral Nr\endcsname{%
939     \noexpand\ch@fig{115}%

```

```

940 }%
941 \expandafter\xdef\csname\ds@black Nr\endcsname{%
942   \noexpand\ch@fig{121}%
943 }%
944 \expandafter\xdef\csname\ds@white Gh\endcsname{%
945   \noexpand\ch@fig{112}%
946 }%
947 \expandafter\xdef\csname\ds@neutral Gh\endcsname{%
948   \noexpand\ch@fig{118}%
949 }%
950 \expandafter\xdef\csname\ds@black Gh\endcsname{%
951   \noexpand\ch@fig{124}%
952 }%
953 \expandafter\xdef\csname\ds@white C\endcsname{%
954   \noexpand\ch@fig{145}%
955 }%
956 \expandafter\xdef\csname\ds@neutral C\endcsname{%
957   \noexpand\ch@fig{151}%
958 }%
959 \expandafter\xdef\csname\ds@black C\endcsname{%
960   \noexpand\ch@fig{157}%
961 }%
962 }
963 \def\Imi{\ch@fig{157}}
964 \def\wE{\ch@fig{216}}
965 \def\nE{\ch@fig{222}}
966 \def\sE{\ch@fig{228}}
967 \def\wX{\ch@fig{180}}
968 \def\NX{\ch@fig{186}}
969 \def\sX{\ch@fig{192}}
970

```

`\dia@above` The content of the box above a diagram is controlled by the macro `\dia@above`. It just delegates the information to a couple of other macros, which then generate the displayed information above the diagram.

```

971 \newboolean{above@newline}
972 \newcommand{\above@newline}{\ifthenelse{\boolean{above@newline}}{\linebreak}{\setboolean{above@new
973 \def\dia@above{%
974   \setboolean{above@newline}{false}%
975   \@dia@number%
976   \@dia@authors%
977   \@dia@city%
978   \@dia@after%
979   \@dia@version%
980   \@dia@source%
981   \@dia@correction%
982   \@dia@tournament%
983   \@dia@award%
984   \@dia@dedic%
985   \@dia@fidealbum%
986 }

```

`\dia@below` As before, the macro `\dia@below` creates the displayed information below the chessboard - forwarding to a couple of other macros.

```

987 \def\dia@below{%
988   \bgroup%
989   \if@stipulation%
990     \@dia@stipulation%
991   \fi%
992   \ifx@cond\else%
993     \@dia@condition%
994   \fi%
995   \ifx@twins\else%
996     \@dia@twins%
997   \fi%
998   \@dia@piecedefs%
999   \@dia@remark%
1000 \ifthenelse{\boolean{@solafterdiagram}}{%
1001   \below@newline%
1002   \the\sol@tk%
1003 }{%
1004 \noindent\hbox{ }\newline\hbox{ }%
1005 \egroup%
1006 }

```

`\@dia@number` The `\@dia@number` macro simply creates the diagram number in a single paragraph.

```

1007 \def\@dia@number{%
1008   %\ifdi@no\above@newline{\authorfont\thediag}\fi%
1009   \ifthenelse{\boolean{@cpd@numbering@local}}{%
1010     \above@newline{\authorfont\thediag}%
1011   }{%
1012 }

```

`\@dia@authors` This macro is used to create the list of authors specified within the `\author` macro inside the `diagram` environment. Depending on the `TeX`-boolean `normal@names` we either simply display the registered author or parse the list of authors by using the generic `\@parseTokenList` macro.

```

1013 \def\@dia@authors{%
1014   \ifauth@r%
1015     \ifnormal@names%
1016       \above@newline
1017       {\authorfont\the\aut@tk}%
1018     \else%
1019       \let\@action=\@dia@writename% Parse the list of authors
1020       \@parseTokenlist\aut@tk;
1021     \fi%
1022   \fi%
1023 }

1024 \def\@show@city#1;{\if@notfirst\ \slash\ \else\@notfirsttrue\fi#1}
1025
1026 \def\@p@rsecity#1; {\@show@city#1;\l@klist}
1027
1028 \def\@dia@city{%
1029   \ifthenelse{\boolean{showcity}}{%
1030     \if@city%
1031       \above@newline%

```

```

1032     \bgroup%
1033     \cityfont\@notfirstfalse%
1034     \let\@action=\p@rsecity\@parseTokenlist\city@tk;%
1035     \egroup%
1036     \fi%
1037   }%
1038 }
1039
1040 \def\@dia@after{%
1041   \if@after%
1042     \bgroup%
1043     \above@newline%
1044     \dedicfont\the\after@tk%
1045     \egroup%
1046     \fi%
1047 }
1048
1049 \def\@dia@version{%
1050   \if@version%
1051     \above@newline%
1052     \bgroup%
1053     \dedicfont\the\version@tk%
1054     \egroup%
1055     \fi%
1056 }
1057
1058 \def\@dia@date{%
1059   \ifnum\from@month>\z@%
1060     \if@day%
1061       \the\day@tk.\write@month\from@month%
1062     \else%
1063       \write@month\from@month%
1064     \fi%
1065     \ifnum\to@month>\z@--\write@month\to@month\fi%
1066     \if@day.\else/\fi%
1067   \fi%
1068   \if@year\the\year@tk\fi%
1069 }
1070
1071 \def\@dia@source{%
1072   \if@source%
1073     \above@newline%
1074     \bgroup%
1075     \sourcefont%
1076     \if@sourcenr\the\sourcenr@tk\ \fi
1077     \the\source@tk%
1078     \if@date\ \fi\@dia@date%
1079     \if@issue\ \the\issue@tk\fi%
1080     \if@pages ,\ \the\pages@tk\fi%
1081     \egroup%
1082   \else%
1083     \if@tournament\else\if@date%
1084       \above@newline%
1085     \bgroup%

```

```

1086         \sourcefont%
1087         \@dia@date%
1088         \egroup%
1089     \fi\fi%
1090 \fi%
1091 }
1092
1093 \def\@dia@correction{%
1094     \if@correction%
1095         \above@newline%
1096         \bgroup%
1097         \dedicfont\the\correction@tk%
1098         \egroup%
1099     \fi%
1100 }
1101
1102 \def\@dia@tournament{%
1103     \if@tournament
1104         \above@newline%
1105         \bgroup%
1106         \awardfont%
1107         \the\tournament@tk
1108         \if@source\else\if@date%
1109             \ \ \@dia@date%
1110         \fi\fi%
1111         \egroup%
1112     \fi%
1113 }
1114
1115 \def\@dia@award{%
1116     \if@award%
1117         \above@newline%
1118         \bgroup%
1119         \awardfont\the\award@tk%
1120         \egroup%
1121     \fi%
1122 }
1123
1124 \def\@dia@dedic{%
1125     \if@dedication%
1126         \above@newline%
1127         \bgroup%
1128         \dedicfont\the\dedic@tk%
1129         \egroup%
1130     \fi%
1131 }
1132
1133 \def\@show@album#1/#2;{#1 FIDE-Album #2}
1134
1135 \def\@dia@fidealalbum{%
1136     \if@fidealalbum%
1137         \above@newline%
1138         {\expandafter\@show@album\the\fidealalbum@tk;}%
1139     \fi%

```

```

1140 }
1141
1142 \def\@twinskip{\ \ }
1143
1144 \def\@dia@stipulation{%
1145   \if@stipulation%
1146     \bgroup%
1147     \stipfont%
1148     \the\stipulation@tk%
1149     \ifx@twins%
1150       \let\below@newline\@twinskip%
1151       \@dia@twins%
1152     \else\ifx@cond%
1153       \let\below@newline\@twinskip%
1154       \@dia@condition%
1155     \fi\fi%
1156     \egroup%
1157     \let\below@newline\newline%
1158   \else%
1159     \x@twinsfalse%
1160     \x@condfalse%
1161     \let\below@newline\relax%
1162   \fi%
1163 }
1164
1165 \def\x@write@twin#1; {%
1166   \hskip1em#1%
1167   \@lefttrue\let\below@newline\newline%
1168   \let\@action\write@twins%
1169   \l@@klist%
1170 }
1171
1172 \def\write@twins#1; {%
1173   \setbox\@test@box=\hbox{#1\if@left~~\fi}%
1174   \ifdim\wd\@test@box>4\sq@width%
1175     \below@newline%
1176     \@lefttrue%
1177     #1%
1178   \else%
1179     \if@left%
1180       \below@newline%
1181     \fi%
1182     \noindent\hbox to 4\sq@width{#1\hfil}%
1183     \if@left%
1184       \@leftfalse%
1185     \else%
1186       \@lefttrue%
1187     \fi%
1188   \fi%
1189   \let\below@newline\newline%
1190   \l@@klist%
1191 }
1192
1193 \def\@dia@twins{%

```

```

1194 \if@twins%
1195 \bgroup%
1196 \@lefttrue%
1197 \remfont%
1198 \ifx@twins%
1199 \let\@action=\x@write@twin%
1200 \else%
1201 \let\@action=\write@twins%
1202 \fi%
1203 \@parseTokenlist\twins@tk;%
1204 \egroup%
1205 \let\below@newline\newline%
1206 \fi%
1207 }
1208
1209 \def\@dia@condition{%
1210 \if@condition%
1211 \bgroup%
1212 \@lefttrue%
1213 \remfont%
1214 \ifx@cond%
1215 \let\@action=\x@write@twin%
1216 \else%
1217 \let\@action=\write@twins%
1218 \fi%
1219 \@parseTokenlist\condition@tk;%
1220 \egroup%
1221 \let\below@newline\newline%
1222 \fi%
1223 }
1224
1225 \def\check@piecedef{%
1226 \ifx\next@piecedef\relax%
1227 \let\col@action=\relax%
1228 \else%
1229 \let\col@action=\@@piecedef%
1230 \fi%
1231 \col@action%
1232 }
1233 \def\@@@piecedef#1{\csname#1\x@piecedef\endcsname\parse@piecedef}
1234
1235 \def\parse@piecedef{\futurelet\next@piecedef\check@piecedef}
1236
1237 \def\@piecedef#1#2#3{%
1238 \def\x@piecedef{#2}%
1239 \below@newline%
1240 \hbox{%
1241 \parse@piecedef#1\relax%
1242 \ = #3}%
1243 }
1244
1245 \def\write@piecedefs#1; {%
1246 \@piecedef#1%
1247 \l@@klist%

```

```

1248 }
1249
1250 \def\@dia@piecedefs{%
1251   \if@piecedefs%
1252     \bgroup%
1253     \@lefttrue%
1254     \let\below@newline\newline%
1255     \remfont\let\@action=\write@piecedefs%
1256     \@parseTokenlist\piecedefs@tk;%
1257     \egroup%
1258   \fi%
1259 }
1260
1261 \def\@dia@remark{%
1262   \if@remark%
1263     \bgroup%
1264     \@lefttrue%
1265     \remfont\let\@action=\write@twins%
1266     \@parseTokenlist\remark@tk;%
1267     \egroup%
1268     \let\below@newline\newline%
1269   \fi%
1270 }
1271
1272 \def\parse@params#1{%
1273   \ifcase\help@a\relax
1274     \label@tk={#1}\ifx\relax#1\else\@labeltrue\fi\or%
1275     \number@tk={#1}\ifx\relax#1\else\@numbertrue\fi\or%
1276     \aut@tk={#1}\ifx\relax#1\else\@authrtrue\fi\or%
1277     \city@tk={#1}\ifx\relax#1\else\@citytrue\fi\or%
1278     \sourcetr@tk={#1}\ifx\relax#1\else\@sourcetrtrue\fi\or%
1279     \source@tk={#1}\ifx\relax#1\else\@sourcetrtrue\fi\or%
1280     \day@tk={#1}\ifx\relax#1\else\@daytrue\fi\or%
1281     \from@month=#1\or%
1282     \to@month=#1\or%
1283     \year@tk={#1}\ifx\relax#1\else\@yeartrue\fi\or%
1284     \issue@tk={#1}\ifx\relax#1\else\@issuetrtrue\fi\or%
1285     \pages@tk={#1}\ifx\relax#1\else\@pagestrtrue\fi\or%
1286     \tournament@tk={#1}\ifx\relax#1\else\@tournamenttrue\fi\or%
1287     \award@tk={#1}\ifx\relax#1\else\@awardtrue\fi\or%
1288     \after@tk={#1}\ifx\relax#1\else\@aftertrue\fi\or%
1289     \version@tk={#1}\ifx\relax#1\else\@versiontrue\fi\or%
1290     \correction@tk={#1}\ifx\relax#1\else\@correctiontrue\fi\or%
1291     \dedic@tk={#1}\ifx\relax#1\else\@dedicationtrue\fi\or%
1292     \theme@tk={#1}\ifx\relax#1\else\@themetrtrue\fi\or%
1293     \twins@tk={#1}\ifx\relax#1\else\@twinstrtrue\fi\or%
1294     \computer@tk={#1}\or%
1295     \comment@tk={#1}\ifx\relax#1\else\@commenttrue\fi\or%
1296     \judgement@tk={#1}\ifx\relax#1\else\@judgementtrue\fi\or%
1297     \sol@tk={#1}%
1298   \fi%
1299   \advance\help@a \one%
1300   \l@@klist%
1301 }

```

```

1302
1303 \def\split@param#1{%
1304   \@labelfalse\@numberfalse\@authrfalse\@cityfalse%
1305   \@sourcetrue\@sourcefalse\@dayfalse\@yearfalse%
1306   \@issuefalse\@pagesfalse\@tournamentfalse\@awardfalse%
1307   \@afterfalse\@versionfalse\@correctionfalse\@dedicationfalse%
1308   \@themefalse\@twinsfalse\@commentfalse\@judgementfalse%
1309   \help@a=\z%
1310   \let\@action=\parse@params\l@tklist#1\@list%
1311 }
1312 \newcommand{\solpar}{\par}
1313 \def\@dia@solution{%
1314   \bgroup%
1315   \parindent\z%
1316   \parskip\tw@p%
1317   {\bfseries%
1318     \noindent\if@label\showlabel{\the\label@tk}\fi%
1319     \if@number\the\number@tk) \fi%
1320     \ifauth@r%
1321       \ifnormal@names%
1322         \the\aut@tk%
1323       \else%
1324         {\@notfirstfalse% We are the first one
1325           \def\name@sep{,}%
1326           \let\@action=\@sol@writename%
1327           \@parseTokenlist\aut@tk;}:%
1328         \fi%
1329         \newline%
1330       \fi%
1331   }%
1332   \if@develop\if@judgement\the\judgement@tk\solpar\fi\fi%
1333   \the\sol@tk\solpar%
1334   \if@comment\the\comment@tk\solpar\fi%
1335   \egroup%
1336 }
1337 \grid@width=0.6\p@
1338 \inner@frame=0.6\p@
1339 \outer@frame=1.2\p@
1340 \space@frame=\outer@frame
1341 \v@frame@dist=\tw@p%
1342 \h@frame@dist=\tw@p%
1343 \space@frame@dist=\z@
1344 \v@space@dist=1em
1345 \def\@show@figurine{%
1346   \noindent%
1347   \@figurine@number%
1348   \@figurine@author%
1349   \@figurine@city%
1350   \@figurine@after%
1351   \@figurine@correction%
1352   \@figurine@version%
1353   \@figurine@source%
1354   \@figurine@tournament%
1355   \@figurine@award%

```

```

1356 \@figurine@dedic%
1357 \@figurine@pieces%
1358 \@figurine@stip%
1359 \@figurine@twins%
1360 \@figurine@conditions%
1361 \@figurine@remarks%
1362 \@figurine@computer%
1363 }
1364 \def\@figurine@number{\authorfont\thediag)}
1365
1366 \def\p@rseauthor@figurine#1,#2; {%
1367 \ifnotfirst, \else\@notfirsttrue\fi#2 #1%
1368 \l@klist%
1369 }
1370
1371 \def\@figurine@author{%
1372 {\ifauth@r%
1373 \authorfont\@notfirstfalse%
1374 \let\@action=\p@rseauthor@figurine%
1375 \@parseTokenlist\aut@tk;%
1376 \ \ %
1377 \fi}%
1378 }
1379
1380 \def\@figurine@city{%
1381 {\if@city%
1382 \cityfont\@notfirstfalse%
1383 \let\@action=\p@rsecity\@parseTokenlist\city@tk;%
1384 \ \ \ %
1385 \fi}%
1386 }
1387
1388 \def\@figurine@after{\if@after{\dedicfont\ \ \the\after@tk}\fi}
1389
1390 \def\@figurine@correction{%
1391 \if@correction{\dedicfont\ \ \the\correction@tk}\fi%
1392 }
1393
1394 \def\@figurine@version{%
1395 \if@version{\dedicfont\ \ \the\version@tk}\fi%
1396 }
1397
1398 \def\@figurine@source{%
1399 {\if@source%
1400 \sourcefont%
1401 \if@sourcenr\the\sourcenr@tk\ \fi%
1402 \the\source@tk%
1403 \if@date\ \ \fi\@dia@date%
1404 \if@issue , \the\issue@tk\fi%
1405 \if@pages , \the\pages@tk\fi%
1406 \fi}%
1407 }
1408
1409 \def\@figurine@tournament{%

```

```

1410 \if@tournament{\awardfont\ \ \the\tournament@tk}\fi%
1411 }
1412
1413 \def\@figurine@award{%
1414 \if@award{\awardfont\ \ \the\award@tk}\fi%
1415 }
1416
1417 \def\@figurine@dedic{%
1418 \if@dedication{\awardfont\ \ \the\dedic@tk}\fi%
1419 }
1420 \def\show@squares#1\@list{ch@fig{the\help@a}#1, }
1421
1422 \def\@figurine@pieces{%
1423 {\if@pieces%
1424 \let\@action=\p@rsepieces%
1425 \let\piece@job\show@squares%
1426 \@parseTokenlist\pieces@tk,%
1427 \fi}%
1428 }
1429 \def\@figurine@stip{%
1430 \if@stipulation{\stipfont\ \ \the\stipulation@tk}\fi%
1431 }
1432
1433 \def\@figurine@conditions{%
1434 \if@condition{\remfont\ \ \the\condition@tk}\fi%
1435 }
1436
1437 \def\@figurine@twins{%
1438 \if@twins{\remfont\ \ \the\twins@tk}\fi%
1439 }
1440
1441 \def\@figurine@computer{%
1442 \ifthenelse{\boolean{showcomputer}}{%
1443 \if@computer\ \computerproofedsymbol\fi%
1444 }{%}%
1445 }
1446
1447 \def\@figurine@remarks{%
1448 \if@remark{\stipfont\ \ \the\remark@tk}\fi%
1449 }
1450 \def\do@dia@job{\@write@sol\ifvmode\noindent\fi\unhbox\dia@box}
1451 \def\solhead#1{\split@param{#1}\@dia@solution}}
1452 \def\@write@sol{%
1453 \ifs@lu%
1454 \immediate\write\s@lfd{%
1455 \noexpand\solhead{%
1456 {\the\label@tk}%
1457 {\thediag}%
1458 {\the\aut@tk}%
1459 {\the\city@tk}%
1460 {\the\sourcenr@tk}%
1461 {\the\source@tk}%
1462 {\the\day@tk}%
1463 {\the\from@month}%

```

```

1464         {\the\to@month}%
1465         {\the\year@tk}%
1466         {\the\issue@tk}%
1467         {\the\pages@tk}%
1468         {\the\tournament@tk}%
1469         {\the\award@tk}%
1470         {\the\after@tk}%
1471         {\the\version@tk}%
1472         {\the\correction@tk}%
1473         {\the\dedic@tk}%
1474         {\the\theme@tk}%
1475         {\the\twins@tk}%
1476         {\the\computer@tk}%
1477         {\the\comment@tk}%
1478         {\the\judgement@tk}%
1479         {\the\sol@tk}%
1480     } %end of \solhead
1481 }%
1482 \fi
1483 }
1484 \def@months#1-#2;{\from@month=#1\to@month=#2\@datetrue}
1485 \def@dia@writename#1; {\above@newline{\authorfont@dianame#1; }\l@klist}
1486 \def\sol@writename#1; {\sep@names\solname#1; \l@klist}
1487 \def\name@sep{, \ }
1488 \def\sep@names{\if@notfirst\name@sep\else\@notfirsttrue\fi}
1489 \def@checkshort#1/#2#3;{%
1490     \@shortformtrue%
1491     \if#2\@e@list\relax%
1492         \@shortformfalse%
1493     \fi%
1494 }
1495 \def\short@christian#1#2-{%
1496     \if@notfirst -\else\@notfirsttrue\fi%
1497     #1.%
1498     \l@klist%
1499 }
1500
1501 \def@write@christian#1/#2;{#1}
1502
1503 \def\write@christian#1;{%
1504     \@checkshort#1/\@e@list;%
1505     \if@shortform\@write@christian#1;\else#1\fi%
1506 }
1507
1508 \def@write@short#1/#2;{#2}
1509
1510 \def\write@short#1;{%
1511     \@checkshort#1/\@e@list;%
1512     \if@shortform%
1513         \@write@short#1;%
1514     \else%
1515         {\@notfirstfalse\let\@action\short@christian\l@klist#1-\@e@list}%
1516     \fi%
1517 }

```

```

1518 \def\@fullname#1, #2; {\write@christian#2; #1}
1519 \def\@sirname#1, #2; {#1}
1520 \def\@short#1, #2; {\write@short#2;\ #1}
1521 \def\@noname#1, #2; {}
1522 \def\@normalname#1; {#1}
1523 \def\space@vertical{\space@verticaltrue}
1524 \def\space@horizontal{\space@verticalfalse}
1525 \def\cl@arsol{\immediate\openout\s@lfd=\jobname.sol\relax}
1526 \def\getc@lor#1{%
1527   \if#1\ds@white%
1528     \help@a\z@global%
1529     \let\cpd@stepcounterPieces\cpd@stepcounterWhite%
1530   \else\if#1\ds@neutral%
1531     \help@a=6\global%
1532     \let\cpd@stepcounterPieces\cpd@stepcounterNeutral%
1533   \else\if#1\ds@black%
1534     \help@a=12\global%
1535     \let\cpd@stepcounterPieces\cpd@stepcounterBlack%
1536   \else\errmessage{invalid color!}%
1537   \fi\fi\fi%
1538   \getpi@ce%
1539 }
1540
1541 \def\get@text#1{\text@tk={#1}\read@square}
1542
1543 \def\getpi@ce#1{\if#1B\relax\else
1544   \if#1\ds@knight\advance\help@a\@ne%
1545   \else\if#1\ds@bishop\advance\help@a\tw@%
1546   \else\if#1\ds@rook\advance\help@a\thr@@%
1547   \else\if#1\ds@queen\advance\help@a\four%
1548   \else\if#1\ds@king\advance\help@a 5%
1549   \else\if#1C%
1550     % An imitator should not count for any color.
1551     \let\cpd@stepcounterPieces\relax
1552     \advance\help@a 145%
1553   \else\if#1E% Equihopper
1554     \advance\help@a 216%
1555   \else\if#1X% Equihopper senkrecht
1556     \advance\help@a 180%
1557   \else%
1558     \errmessage{invalid piece!}%
1559   \fi\fi\fi\fi\fi\fi\fi\fi\fi\fi%
1560   \futurelet\r@tate\chkr@tate%
1561 }
1562
1563 \def\chkr@tate{%
1564   \if\r@tate \ds@rotation@upside@down\advance\help@a 108\let\nextpr@c=\skipr@t\else%
1565   \if\r@tate \ds@rotation@left\advance\help@a 36\let\nextpr@c=\skipr@t\else%
1566   \if\r@tate \ds@rotation@right\advance\help@a 72\let\nextpr@c=\skipr@t\else%
1567   \let\nextpr@c\piece@job\fi\fi\fi\nextpr@c%
1568 }
1569 \def\skipr@t#1{\piece@job}
1570 \def\l@k{\futurelet\whatsnext\parsefi@lds}
1571 \def\parsefi@lds{%

```

```

1572 \if\whatsnext\@list%
1573 \let\nextprc\relax%
1574 \else
1575 \let\nextprc\read@square%
1576 \fi%
1577 \nextprc%
1578 }
1579
1580 \def\set@current@square@index#1#2{%
1581 \setcounter{cpd@current@square@index}{#1+\value{cpd@linesmax}*#2}%
1582 }
1583 \def\set@current@square@value#1{%
1584 \expandafter%
1585 \xdef\csname cpd@square@\roman{cpd@current@square@index}\endcsname{#1}%
1586 }
1587 \def\get@current@square@value{%
1588 \setcounter{cpd@current@square@value}%
1589 {\csname cpd@square@\roman{cpd@current@square@index}\endcsname}%
1590 }
1591 \def\set@piece{%
1592 \ifnum\plane=\current@plane%
1593 \cpd@stepcounterPieces%
1594 \set@current@square@index\lin@\row%
1595 \get@current@square@value%
1596 \ifthenelse{\value{cpd@current@square@value}=\m@ne}
1597 {\set@current@square@value{\the\help@a}}%
1598 {\ifthenelse{\value{cpd@current@square@value}=144}%
1599 {\set@current@square@value{\the\help@a+18}}%
1600 {\errmessage{Trying to set a piece to an occupied square}}}%
1601 \fi%
1602 \l@k%
1603 }
1604 \def\cpd@fen@setpiece{%
1605 \ifnum\plane=\current@plane%
1606 \cpd@stepcounterPieces%
1607 \set@current@square@index{\value{cpd@line}}{\value{cpd@row}}%
1608 \get@current@square@value%
1609 \ifthenelse{\value{cpd@current@square@value}=\m@ne}
1610 {\set@current@square@value{\the\help@a}}%
1611 {\ifthenelse{\value{cpd@current@square@value}=144}%
1612 {\set@current@square@value{\the\help@a+18}}%
1613 {\errmessage{Trying to set a piece to an occupied square}}}%
1614 \fi%
1615 }
1616 \def\set@nofield, {%
1617 \ifnum\plane=\current@plane%
1618 \set@current@square@index\lin@\row%
1619 \get@current@square@value%
1620 \ifthenelse{\value{cpd@current@square@value}=\m@ne}%
1621 {}% This is an empty white square, nothing to do
1622 {\ifthenelse{\value{cpd@current@square@value}=144}%
1623 {\set@current@square@value{\m@ne}}%
1624 {\errmessage{Trying to set a piece to an occupied square}}}%
1625 \fi%

```

```

1626 \l@@klist%
1627 }
1628 \def\set@frame, {%
1629 \ifnum\pl@ne=\current@plane%
1630 \vGrid{\the\lin@}{\the\r@w}\@ne%
1631 \hGrid{\the\lin@}{\the\r@w}\@ne%
1632 \advance\lin@\@ne%
1633 \vGrid{\the\lin@}{\the\r@w}\@ne%
1634 \advance\lin@\m@ne\advance\r@w\@ne%
1635 \hGrid{\the\lin@}{\the\r@w}\@ne%
1636 \fi%
1637 \l@@klist%
1638 }
1639 \def\e@list{\relax}
1640 \def\l@@klist{\futurelet\nextlist\ch@cklst}
1641 \def\ch@cklst{%
1642 \ifx\nextlist\e@list%
1643 \let\nextpr@c=\relax%
1644 \else%
1645 \let\nextpr@c=@action%
1646 \fi%
1647 \nextpr@c%
1648 }
1649 \def\@cpd@handle@fen#1{%
1650 \ifx#1\relax%
1651 \ifthenelse{\value{cpd@line}=8}%
1652 {%
1653 \setcounter{cpd@line}{0}%
1654 \addtocounter{cpd@row}{\m@ne}%
1655 }%
1656 {%
1657 \errmessage{FEN: there is now row to end here}%
1658 }%
1659 \else\ifx#1K\relax%
1660 \let\cpd@stepcounterPieces\cpd@stepcounterWhite%
1661 \help@a=5%
1662 \cpd@fen@setpiece%
1663 \addtocounter{cpd@line}{\@ne}%
1664 \else\ifx#1Q\relax%
1665 \let\cpd@stepcounterPieces\cpd@stepcounterWhite%
1666 \help@a=4%
1667 \cpd@fen@setpiece%
1668 \addtocounter{cpd@line}{\@ne}%
1669 \else\ifx#1R\relax%
1670 \let\cpd@stepcounterPieces\cpd@stepcounterWhite%
1671 \help@a=3%
1672 \cpd@fen@setpiece%
1673 \addtocounter{cpd@line}{\@ne}%
1674 \else\ifx#1B\relax%
1675 \let\cpd@stepcounterPieces\cpd@stepcounterWhite%
1676 \help@a=2%
1677 \cpd@fen@setpiece%
1678 \addtocounter{cpd@line}{\@ne}%
1679 \else\ifx#1N\relax%

```

```

1680     \let\cpd@stepcounterPieces\cpd@stepcounterWhite%
1681     \help@a=1%
1682     \cpd@fen@setpiece%
1683     \addtocounter{cpd@line}{\@ne}%
1684 \else\ifx#1P\relax%
1685     \let\cpd@stepcounterPieces\cpd@stepcounterWhite%
1686     \help@a=0%
1687     \cpd@fen@setpiece%
1688     \addtocounter{cpd@line}{\@ne}%
1689 \else\ifx#1k\relax%
1690     \let\cpd@stepcounterPieces\cpd@stepcounterBlack%
1691     \help@a=17%
1692     \cpd@fen@setpiece%
1693     \addtocounter{cpd@line}{\@ne}%
1694 \else\ifx#1q\relax%
1695     \let\cpd@stepcounterPieces\cpd@stepcounterBlack%
1696     \help@a=16%
1697     \cpd@fen@setpiece%
1698     \addtocounter{cpd@line}{\@ne}%
1699 \else\ifx#1r\relax%
1700     \let\cpd@stepcounterPieces\cpd@stepcounterBlack%
1701     \help@a=15%
1702     \cpd@fen@setpiece%
1703     \addtocounter{cpd@line}{\@ne}%
1704 \else\ifx#1b\relax%
1705     \let\cpd@stepcounterPieces\cpd@stepcounterBlack%
1706     \help@a=14%
1707     \cpd@fen@setpiece%
1708     \addtocounter{cpd@line}{\@ne}%
1709 \else\ifx#1n\relax%
1710     \let\cpd@stepcounterPieces\cpd@stepcounterBlack%
1711     \help@a=13%
1712     \cpd@fen@setpiece%
1713     \addtocounter{cpd@line}{\@ne}%
1714 \else\ifx#1p\relax%
1715     \let\cpd@stepcounterPieces\cpd@stepcounterBlack%
1716     \help@a=12%
1717     \cpd@fen@setpiece%
1718     \addtocounter{cpd@line}{\@ne}%
1719 \else\ifx#1\relax%
1720     \addtocounter{cpd@line}{1}%
1721 \else\ifx#2\relax%
1722     \addtocounter{cpd@line}{2}%
1723 \else\ifx#3\relax%
1724     \addtocounter{cpd@line}{3}%
1725 \else\ifx#4\relax%
1726     \addtocounter{cpd@line}{4}%
1727 \else\ifx#5\relax%
1728     \addtocounter{cpd@line}{5}%
1729 \else\ifx#6\relax%
1730     \addtocounter{cpd@line}{6}%
1731 \else\ifx#7\relax%
1732     \addtocounter{cpd@line}{7}%
1733 \else\ifx#8\relax%

```



```

1788 \raise#2\sq@width\hbox to \z@{%
1789 \hskip#1\sq@width\hskip-.5\grid@width%
1790 \vrule height#3\sq@width width\grid@width\hss%
1791 }%
1792 }
1793
1794 \def\@hGrid#1#2#3{%
1795 \raise#2\sq@width\hbox to \z@{%
1796 \hskip#1\sq@width%
1797 \vrule width#3\sq@width height .5\grid@width depth%
1798 .5\grid@width\hss%
1799 }%
1800 }
1801 \def\@selGrid#1#2, {%
1802 \ifnum\plane=\current@plane%
1803 \if#1h%
1804 \@hGrid#2%
1805 \else\if#1v%
1806 \@vGrid#2%
1807 \else%
1808 \errmessage{Wrong GridSelector #1}%
1809 \fi\fi%
1810 \fi%
1811 \l@oklist%
1812 }
1813 \def\@stdgrid{%
1814 \setbox\plane@box=\vbox{\hbox{%
1815 \help@a=\tw@%
1816 \loop%
1817 \ifnum\help@a<\lines@max%
1818 \@vGrid{\the\help@a}{\the\rows@max}%
1819 \advance\help@a\tw@%
1820 \repeat%
1821 \help@a=\tw@%
1822 \loop%
1823 \ifnum\help@a<\rows@max%
1824 \@hGrid{0}{\the\help@a}{\the\lines@max}%
1825 \advance\help@a\tw@%
1826 \repeat%
1827 \box\plane@box
1828 }}%
1829 }
1830 \def\ds@xlabel#1{%
1831 \label@tk={#1}\@labeltrue%
1832 }
1833
1834 \def\@set@label#1;{\ifds@label\label{#1}\fi}
1835 \def\@init@vars{%
1836 \global\s@lufalse
1837 \ifthenelse{\boolean{@cpd@numbering@global}}{%
1838 \setboolean{@cpd@numbering@local}{true}%
1839 }{%
1840 \setboolean{@cpd@numbering@local}{false}%
1841 }%

```

```

1842 \setboolean{cpd@checkPieceCounts}{false}%
1843 \setcounter{cpd@defWhitePieces}{\z@}%
1844 \setcounter{cpd@defBlackPieces}{\z@}%
1845 \setcounter{cpd@defNeutralPieces}{\z@}%
1846 \setcounter{cpd@whitePieces}{\z@}%
1847 \setcounter{cpd@blackPieces}{\z@}%
1848 \setcounter{cpd@neutralPieces}{\z@}%
1849 \lin@{\z@}
1850 }
1851
1852 \def\clear@board{%
1853 \ifthenelse{\boolean{allwhite}\and\boolean{switchcolors}}%
1854   {\errmessage{'allwhite' and 'switchcolors' do not make sense used together.}}%
1855   {\@whitefield=\m@ne\@blackfield=144}%
1856 \ifthenelse{\boolean{allwhite}}{\@blackfield=\m@ne}{}%
1857 \ifthenelse{\boolean{switchcolors}}{\@whitefield=144\@blackfield=\m@ne}{}%
1858 \setcounter{cpd@current@row}{0}%
1859 \whiledo{\value{cpd@current@row}<\value{cpd@rowsmax}}{%
1860   \setcounter{cpd@current@line}{0}%
1861   \whiledo{\value{cpd@current@line}<\value{cpd@linesmax}}{%
1862     \set@current@square@index{\value{cpd@current@line}}{\value{cpd@current@row}}%
1863     \setcounter{cpd@helper}{\the\current@plane+\value{cpd@current@line}+\value{cpd@current@row}}%
1864     \ifthenelse{\isodd{\value{cpd@helper}}}%
1865       {\set@current@square@value{\@whitefield}}%
1866       {\set@current@square@value{\@blackfield}}%
1867     \addtocounter{cpd@current@line}{\@ne}%
1868   }%
1869   \addtocounter{cpd@current@row}{\@ne}%
1870 }%
1871 }
1872
1873 \def\put@row#1{%
1874 \lin@{\z@}
1875 \help@b=#1%
1876 \advance\help@b\brd@ff%
1877 \hbox{%
1878   \ifthenelse{\boolean{legend}}{%
1879     \advance\@rows'1%
1880     \llap{\raise .25\sq@width\hbox{\legendfont \char\@rows\ }}%
1881   }{}%
1882   \if@stereo%
1883     \ifnum\current@plane>\z@%
1884       \ifnum\@rows=12%
1885         \llap{\raise .5\sq@width\hbox{\cpd@boardfont c6\ }}%
1886       \fi%
1887     \fi%
1888   \fi%
1889   \hbox to \z@{\vbox to \sq@width{}}%
1890   \set@current@square@index{\lin@}{#1}%
1891   \loop%
1892     \get@current@square@value%
1893     \ifthenelse{\value{cpd@current@square@value}=\m@ne}%
1894       {\wF}%
1895       {\char\value{cpd@current@square@value}}%

```

```

1896 % \ifnum\count\help@b=\m@ne\wF%
1897 % \else\char\count\help@b\fi%
1898 \advance\lin@\@ne%
1899 \addtocounter{cpd@current@square@index}{1}%
1900 % \advance\help@b\@ne%
1901 \ifnum\lin@<\lines@max\repeat%
1902 }%
1903 }
1904 % \def\put@line#1{%
1905 % \lin@z@%
1906 % \help@b=#1%
1907 % \advance\help@b\brd@ff%
1908 % \hbox{%
1909 % \if@stereo%
1910 % \ifnum\current@plane>z@%
1911 % \ifnum@rows=12%
1912 % \llap{\raise .5\sq@width\hbox{\cpd@boardfont c6\ }}%
1913 % \fi%
1914 % \fi%
1915 % \fi%
1916 % \hbox to z@{\vbox to \sq@width{}}%
1917 % \loop%
1918 % \ifnum\count\help@b=\m@ne\wF%
1919 % \else\char\count\help@b\fi%
1920 % \advance\lin@\@ne\advance\help@b\@ne%
1921 % \ifnum\lin@<\lines@max\repeat%
1922 % }%
1923 % }
1924 \def\@parseTokenlist#1#2{\expandafter\l@klist\the#1#2 \e@list}
1925 \def\@addToPlane#1{%
1926 \setbox\plane@box=\vbox{\hbox{%
1927 \@parseTokenlist#1,%
1928 \box\plane@box%
1929 }}%
1930 }
1931 \def\put@plane{%
1932 % We might want gridchess
1933 \if@stdgrid%
1934 \@stdgrid%
1935 \fi%
1936 % Let us first set the fieldframes
1937 \if@fieldframe%
1938 \let\@action\read@square%
1939 \let\plane@job\set@frame%
1940 \@addToPlane\fieldframe@tk%
1941 \fi%
1942 % Now we set text to all squares which are given using \fieldtext
1943 \if@fieldtext%
1944 \let\@action\p@rsettext%
1945 \let\plane@job\set@text%
1946 \@addToPlane\fieldtext@tk%
1947 \fi%
1948 % Then we should add the gridlines
1949 \if@gridlines%

```

```

1950     \let\@action\read@plane%
1951     \let\plane@job\@selGrid%
1952     \@addToPlane\gridlines@tk%
1953 \else%
1954     \if@stereo%
1955         \stereo@center%
1956     \fi%
1957 \fi%
1958 % In an 'allwhite' diagram we display dotted lines
1959 \ifthenelse{\boolean{allwhite}}{%
1960     \setbox\plane@box=\vbox{\hbox{%
1961         \psset{unit=\sq@width,linewidth=.4pt,linestyle=dotted,dotsep=.125}%
1962         \setcounter{field@border}{1}%
1963         \whiledo{\value{field@border}<\lines@max}{%
1964             \psline(\value{field@border},0)(\value{field@border},\rows@max)%
1965             \addtocounter{field@border}{\@ne}%
1966         }%
1967         \setcounter{field@border}{1}%
1968         \whiledo{\value{field@border}<\rows@max}{%
1969             \psline(0,\value{field@border})(\lines@max,\value{field@border})%
1970             \addtocounter{field@border}{\@ne}%
1971         }%
1972         \box\plane@box%
1973     }}%
1974 }{%
1975 % Now we should clear the board
1976 \clear@board%
1977 % Let us now parse the list of pieces
1978 \ifthenelse{\boolean{@cpd@fen}}{%
1979     \ifthenelse{\value{cpd@rowsmax}=8}{\errmessage{FEN is only allowed for 8x8 boards.}}
1980     \ifthenelse{\value{cpd@linesmax}=8}{\errmessage{FEN is only allowed for 8x8 boards.}}
1981     \setcounter{cpd@row}{7}%
1982     \setcounter{cpd@line}{0}%
1983     \let\@action\@cpd@parse@fen%
1984     \@parseTokenlist\fen@tk@e@list%
1985 }{%
1986 \if@pieces%
1987     \let\@action\p@rsepieces%
1988     \let\piece@job\l@k\let\plane@job\set@piece%
1989     \@parseTokenlist\pieces@tk,%
1990 \fi%
1991 % Now we clear all fields, which are given using \nofields
1992 \if@nofields%
1993     \let\@action\read@square%
1994     \let\plane@job\set@nofield%
1995     \@parseTokenlist\nofields@tk,%
1996 \fi%
1997 % Now we can put the pieces to the board
1998 \global\setbox\plane@box=\hbox{%
1999     \vbox{\rlap{\box\plane@box}}%
2000     \vbox{%
2001         \chessfont%
2002         \baselineskip=\z@\lineskip=\z@%
2003         \@rows=\rows@max%

```

```

2004      % \multiply@rows by \lines@max%
2005      \loop%
2006          \advance@rows \m@ne%
2007          \put@row@rows%
2008      \ifnum@rows>\z@ \repeat%
2009  }%
2010      % Put a legend if wanted
2011      \ifthenelse{\boolean{legend}}{%
2012          \vbox to \z@{%
2013              \vbox to \z@{\vss}%
2014              \llap{\hbox{\hspace*{\inner@frame}%
2015                  \lin@ \z@%
2016                  \loop%
2017                      \hbox to \sq@width{\hfill{\advance\lin@'a\legendfont\char\lin@}\hfill}}%
2018                      \advance\lin@\@ne%
2019                      \ifnum\lin@<\lines@max \repeat%
2020                  }}\vss}%
2021      }{}%
2022  }%
2023 }
2024 \def\put@sqs@normal{%
2025     \put@plane%
2026     \setbox\sq@box=\hbox{%
2027         \inner@henbox{\box\plane@box}%
2028     }%
2029 }
2030 \def\put@sqs@stereo{%
2031     \setbox\sq@box=\hbox{\hfil\vbox{%
2032         \current@plane=5%
2033         \vskip\v@space@dist%
2034         \loop%
2035             \advance\current@plane\m@ne%
2036             \ifnum\current@plane=\z@%
2037                 \lines@max=\@ight%
2038                 \rows@max=\@ight%
2039             \else%
2040                 \lines@max=f@ur%
2041                 \rows@max=f@ur%
2042             \fi%
2043             % Now we should clear the board
2044             \begin@group% We need this for inner loops!
2045                 \clear@board%
2046                 \put@plane%
2047             \end@group%
2048             \hbox to \bd@width{%
2049                 \hfil%
2050                 \inner@henbox{\box\plane@box}%
2051                 \ifcase\current@plane\or%
2052                     \rlap{\cpd@boardfont\ A}\or%
2053                     \rlap{\cpd@boardfont\ B}\or%
2054                     \rlap{\cpd@boardfont\ C}\or%
2055                     \rlap{\cpd@boardfont\ D}}%
2056             \fi%
2057         \hfil%

```

```

2058     }%
2059     \vskip\v@space@dist%
2060     \ifnum\z@<\current@plane\repeat%
2061   }\hfil}%
2062 }
2063
2064 \def\stereo@center{%
2065   \ifnum\current@plane=\z@%
2066     \setbox\plane@box=\vbox{\hbox{%
2067       \@hGrid\tw@tw@f@ur\@hGrid\tw@ 6f@ur%
2068       \@vGrid\tw@tw@f@ur\@vGrid6\tw@f@ur%
2069       \box\plane@box%
2070     }}%
2071   \fi%
2072 }
2073 \def\put@sqs@space@vertical{%
2074   \setbox\sq@box=\hbox{\hfil\vbox{%
2075     \current@plane=\planes@max%
2076     \vskip\v@space@dist%
2077     \loop%
2078       \advance\current@plane@m@ne%
2079       % Now we should clear the board
2080       \begingroup% We use inner loops!
2081       \clear@board%
2082       \put@plane%
2083       \hbox to \bd@width{%
2084         \inner@hbox{\box\plane@box}%
2085         \advance\current@plane'A%
2086         \rlap{{\cpd@boardfont\ \char\current@plane}}}%
2087       }%
2088       \endgroup%
2089       \vskip\v@space@dist%
2090     \ifnum\z@<\current@plane\repeat%
2091   }\hfil}%
2092 }
2093
2094 \def\put@sqs@space@horizontal{%
2095   \setbox\sq@box=\hbox{%
2096     \current@plane=\z@%
2097     \hskip\h@space@dist%
2098     \loop%
2099       % Now we should clear the board
2100       \begingroup% We use inner loops!
2101       \clear@board%
2102       \put@plane%
2103       \hbox to \bd@width{%
2104         \inner@hbox{\box\plane@box}%
2105         \advance\current@plane'A%
2106         \rlap{{\cpd@boardfont\ \char\current@plane}}}%
2107       }%
2108       \endgroup%
2109       \hskip\h@space@dist%
2110       \advance\current@plane@ne%
2111     \ifnum\planes@max>\current@plane%

```

```

2112     \repeat%
2113 }%
2114 }
2115
2116 \def\put@sqs@space{%
2117   \ifspace@vertical%
2118     \put@sqs@space@vertical%
2119   \else%
2120     \put@sqs@space@horizontal%
2121   \fi%
2122 }
2123 \def\@inner@vframe{%
2124   \if@vframe%
2125     \vrule width \inner@frame%
2126   \else%
2127     \hskip\inner@frame%
2128   \fi%
2129 }
2130
2131 \def\@inner@hframe{%
2132   \if@hframe%
2133     \hrule height \inner@frame%
2134   \else%
2135     \vskip\inner@frame%
2136   \fi%
2137 }
2138 \def\inner@v@frame@rule{%
2139   \if@stereo%
2140     \@inner@vframe%
2141   \else\if@space%
2142     \@inner@vframe%
2143   \else\if@leaveOuter%
2144     \vrule width \inner@frame%
2145   \else%
2146     \@inner@vframe%
2147   \fi\fi\fi%
2148 }
2149
2150 \def\inner@h@frame@rule{%
2151   \if@stereo%
2152     \@inner@hframe%
2153   \else\if@space%
2154     \@inner@hframe%
2155   \else\if@leaveOuter%
2156     \hrule height \inner@frame%
2157   \else%
2158     \@inner@hframe%
2159   \fi\fi\fi%
2160 }
2161
2162 \def\inner@henbox#1{%
2163   \hbox{%
2164     \inner@v@frame@rule%
2165     \vbox{\inner@h@frame@rule#1\inner@h@frame@rule}%

```

```

2166     \inner@v@frame@rule%
2167   }%
2168 }
2169 \def\@outer@vrule{\vrule width \outer@frame}
2170
2171 \def\@outer@hrule{\hrule height \outer@frame}
2172 \def\outer@v@frame@rule{%
2173   \if@stereo%
2174     \@outer@vrule%
2175   \else\if@space%
2176     \@outer@vrule%
2177   \else\if@leaveOuter%
2178     \if@vframe\@outer@vrule\else\hskip\outer@frame\fi%
2179   \else%
2180     \@outer@vrule%
2181   \fi\fi\fi%
2182 }
2183
2184 \def\outer@h@frame@rule{%
2185   \if@stereo%
2186     \@outer@hrule%
2187   \else\if@space%
2188     \@outer@hrule%
2189   \else\if@leaveOuter%
2190     \if@hframe\@outer@hrule\else\vskip\outer@frame\fi%
2191   \else%
2192     \@outer@hrule%
2193   \fi\fi\fi%
2194 }
2195
2196 \def\outer@henbox#1{%
2197   \outer@h@frame@rule%
2198   \hbox{%
2199     \outer@v@frame@rule%
2200     \ifspace@vertical%
2201       \hskip\h@frame@dist%
2202     \fi%
2203     \vbox{%
2204       \ifspace@vertical%
2205         \vskip\v@frame@dist%
2206       \else%
2207         \vskip\v@space@dist%
2208       \fi%
2209       #1%
2210     \ifspace@vertical%
2211       \vskip\v@frame@dist%
2212     \else%
2213       \vskip\v@space@dist%
2214     \fi%
2215   }%
2216   \ifspace@vertical%
2217     \hskip\h@frame@dist%
2218   \fi%
2219   \outer@v@frame@rule%

```

```

2220 }%
2221 \outer@h@frame@rule%
2222 }
2223 \def\ch@fig#1{%
2224 \ifvmode\noindent\fi%
2225 \hbox{\chtextfont\lower.1\fontdimen\tw@\chtextfont\hbox{\char#1}}%
2226 }
2227 \def\@dia@index{%
2228 \@ifundefined{newindex}%
2229 {\errmessage{You should add documentstyle-option 'index'}}{}%
2230 }
2231
2232 \def\showlabel#1{%
2233 \if@develop%
2234 \raise1ex\hbox{\labelfont#1}\penalty\exhyphenpenalty%
2235 \fi%
2236 }
2237
2238 \def\@aidxitem#1, #2, #3{%
2239 \par\medskip#1, \write@christian#2; \dotfill #3%
2240 }
2241
2242 \def\dia@index#1\@sep#2[#3]{\index[#3]{#2/showlabel{#1}}}
2243
2244 \def\parse@aindex#1, {%
2245 \expandafter\dia@index\the\label@tk\@sep#1[author]\l@klist%
2246 }
2247
2248 \def\@aindex{%
2249 \if@aindex%
2250 \ifnormal@names%
2251 \errmessage{Cannot create index entries with normalnames}%
2252 \else\ifauth@r%
2253 \let\@action=\parse@aindex\@parseTokenlist\aut@tk;%
2254 \fi\fi%
2255 \fi%
2256 }
2257
2258 \def\x@sindex#1\@sep{\expandafter\dia@index\the\label@tk\@sep#1[source]}
2259
2260 \def\@sindex{%
2261 \if@sindex\if@source%
2262 \expandafter\x@sindex\the\source@tk\@sep%
2263 \fi\fi%
2264 }
2265
2266 \def\parse@tindex#1, {%
2267 \expandafter\dia@index\the\label@tk\@sep#1[theme]\l@klist%
2268 }
2269
2270 \def\@tindex{%
2271 \if@tindex\if@theme%
2272 \let\@action=\parse@tindex\@parseTokenlist\theme@tk,%
2273 \fi\fi%

```

```

2274 }
2275 \def\@setPieceColor#1#2#3{%
2276   \gdef\ds@white{#1}\gdef\ds@black{#2}\gdef\ds@neutral{#3}%
2277 }
2278
2279 \def\@setPieceSpec#1#2#3#4#5#6{%
2280   \gdef\ds@king{#1}\gdef\ds@queen{#2}\gdef\ds@rook{#3}%
2281   \gdef\ds@bishop{#4}\gdef\ds@knight{#5}\gdef\ds@pawn{#6}%
2282 }
2283
2284 \def\@setPieceRotation#1#2#3{%
2285   \gdef\ds@rotation@left{#1}\gdef\ds@rotation@right{#2}\gdef\ds@rotation@upside@down{#3}%
2286 }
2287 \def\loop@rotation{%
2288   \bgroup%
2289     \ncnt\z@%
2290     \help@a\z@%
2291     \loop%
2292     \ifcase\ncnt%
2293       \def\@theRotation{}%
2294     \or%
2295       \def\@theRotation{\ds@rotation@left}%
2296     \or%
2297       \def\@theRotation{\ds@rotation@right}%
2298     \or%
2299       \def\@theRotation{\ds@rotation@upside@down}%
2300     \fi%
2301     \loop@color%
2302     \advance\ncnt\@ne%
2303     \advance\help@a by 36\relax%
2304     \ifnum\ncnt<\f@ur\repeat%
2305   \egroup%
2306 }
2307
2308 \def\loop@color{%
2309   \bgroup%
2310     \w@cnt\z@%
2311     \loop%
2312     \ifcase\w@cnt%
2313       \def\@theColor{\ds@white}%
2314     \or%
2315       \def\@theColor{\ds@neutral}%
2316     \or%
2317       \def\@theColor{\ds@black}%
2318     \fi%
2319     \loop@piece%
2320     \advance\w@cnt\@ne%
2321     \advance\help@a by 6%
2322     \ifnum\w@cnt<\thr@@\repeat%
2323   \egroup%
2324 }
2325
2326 \def\loop@piece{%
2327   \bgroup%

```

```

2328     \b@cnt\z@%
2329     \loop%
2330         \ifcase\b@cnt%
2331             \def\@thePiece{\ds@pawn}%
2332         \or%
2333             \def\@thePiece{\ds@knight}%
2334         \or%
2335             \def\@thePiece{\ds@bishop}%
2336         \or%
2337             \def\@thePiece{\ds@rook}%
2338         \or%
2339             \def\@thePiece{\ds@queen}%
2340         \or%
2341             \def\@thePiece{\ds@king}%
2342         \fi%
2343         \expandafter\xdef\csname%
2344         \@theColor\@thePiece\@theRotation\endcsname{%
2345             \noexpand\ch@fig{\the\help@a}%
2346         }
2347         \advance\b@cnt\@ne%
2348         \advance\help@a by \@ne%
2349         \ifnum\b@cnt<6\repeat%
2350     \egroup%
2351 }
2352 \elchfont\@fselch
2353
2354 \defaultelchfont%
2355 \diagnum{\@ne}
2356 %% \figcnttrue
2357 \setboolean{piececounter}{true}
2358 \def\@dianame{\@fullname}
2359 \def\@solname{\@fullname}
2360 \space@verticaltrue
2361 \diagnumbering{arabic}
2362 \def\write@month{\@arabic}%
2363 \diagleft
2364 \cl@arsol
2365 \let\orig@author=\author
2366 \let\orig@day=\day
2367 \let\orig@month=\month
2368 \let\orig@year=\year
2369 \let\orig@label=\label
2370 \DefinePieces{wsn}{KDTLSB}{LRU}
2371 \newdimen\normalboardwidth
2372 \def\setboardwidth{%
2373     \normalboardwidth=\@ight\fontdimen\tw@\chessfont%
2374     \advance\normalboardwidth\tw@\inner@frame%
2375     \advance\normalboardwidth\tw@\h@frame@dist%
2376     \advance\normalboardwidth\tw@\outer@frame%
2377 }
2378
2379 \setboardwidth
2380
2381 </style>

```

## 4 The implementation of `cpdparse.sty`

The following contains the style file `cpdparse.sty`, which implements generic parsing of lists.

```

2382 (*cpdparse)
2383 \ProvidesPackage{cpdparse}[2020/12/27]

2384 \def\cpd@parse@list{\futurelet\cpd@parse@lookahead\cpd@parse@check}
2385 \def\cpd@parse@check{%
2386   \ifx\cpd@parse@lookahead\relax\relax%
2387     \let\cpd@parse@next=\relax%
2388   \else%
2389     \let\cpd@parse@next=\cpd@parse@action%
2390   \fi%
2391   \cpd@parse@next%
2392 }

i/cpdparsei

```

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v1.20	General: Introduced two booleans to better control displaying diagram number globally and locally. Removed the old boolean 'di@no'. . . . .	1	versions of @writename command, to be able to change it in other stylefiles for the part over the diagram without influencing the one used for the solution. Added commands to set white, black and neutral Circles within text. . . . .	1
v1.21	General: Impletented issue: 03f/309: handle empty arguments in information collecting commands Fixed typo in @dia@fidealalbum command. . .	1	v1.5.5 General: Changed amount of lowering figurine pieces. . . . .	1
v1.22	General: Fix empty argument detection. Change ra and lra commands to allow for common prefix and suffix. Added generic command insidediagram to allow e.g. footnotes inside diagrams. Fixed numbering when creating empty diagram numbering via speciadiagram.	1	v1.5.6 General: Added new command 'solpar' to allow use of 'putsol' inside a window environment.	1
v1.5	General: Added license meta-comment to publish package on ctan. . . . .	1	v1.6 General: Added boolean showcitcity and code to suppress display of city, when showcitcity is false. Added commands for academic titles, which allow to suppress their display. . . . .	1
v1.5.1	General: Fixed font problem when writing producing piececounter in small diagrams. . . . .	1	v1.6.1 General: Added new command piecedefs specify names of fairy pieces for rotated pieces.	1
v1.5.2	General: Added some percent signs at line ends in @start@diagram and enddiagam to avoid accidently added spaces. . . . .	1	v1.6.2 General: Added boolean for allwhite problems. . . . .	1
v1.5.3	General: Changed switch, which is used to decide, whether infomration about computer proof is displayed to use standard boolean syntax. Symbols about computer proof are now created by standard commands and may therefore be changed by users.	1	v1.6.3 General: Added boolean for board with switched field colors. . . . .	1
v1.5.4	General: Defined 2 different		v1.6.4 General: Added convenience command for 'allwhite' and 'switchcolors' booleans. . . . .	1
			v1.6.5 General: As suggested by Torsten Linß and Thomas Brand added support for Equihopper and turned Equihopper (X) . . .	1
			v1.6.6 General: Introduced new command to switch to the default diagram size. . . . .	1
			v1.6.7 General: Fixed issue '19a' with allwhite on quadratic fields. . .	1
			v1.7.0 General: Implemented Issue '32c': the command diagnum now allows to specify a prefix to	

be used for the following diagrams. . . . .	1	boolean solafterdiagram to latex boolean. . . . .	1
v1.8.0		v1.9	
General: Implemented issue '03f/f2a': Added code to display a legend around the board, controlled by the boolean 'legend'. . . . .	1	General: Implemented issue '03f/932': Renamed boardfont to cpd@boardfont due to a naming collision with another chess package. Changed all font definitions to newcommand instead of def. . . . .	1
v1.8.1			
General: Implemented issue '03f/83c': changed tex			