

# Producing slides with L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub>

Frank Mittelbach

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## 1 Introduction

With L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> it is now no longer necessary to maintain a special format for producing overhead slides. Instead the standard format may be used and internally only different font definition files come into play.

## 2 Usage

For producing slides you have to use **slides** as the document class. This class is very similar to the **slides** style that came with S<sup>U</sup>T<sub>E</sub>X, in fact it is basically a copy changed to work under L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub>.<sup>1</sup> Thus you have to say something like

```
\documentclass[...]{slides}
```

and process this with L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub>.

## 3 Fonts

Note, that that with NFSS you can easily produce slides with special fonts just by calling an appropriate style file (like **times**) in a **\usepackage** command. This works, for example, with all fonts that are defined to be scaleable (e.g., PostScript fonts) since they can be used at any size by NFSS.

However, packages like **pandora** won't work because the standard **.fd** files shipped with NFSS only contain small sizes. You can, of course, produce additional sizes and change the **.fd** files accordingly so that they would be useable for slides as well.

## 4 Invisible text and color separation

In the original S<sup>U</sup>T<sub>E</sub>X it was possible to produce invisible text using the **\invisible** command, so that one was able to put several slides on top of each other (with each slides showing additional details, etc.). It was also possible to produce 'color' slides. This was done by producing individual slides one for each color and placing them on top of each other.

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<sup>1</sup>Therefore you should compare the new class with old S<sup>U</sup>T<sub>E</sub>X styles in case you have local slide classes to see what you have to change in order to use them with L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub>.

The availability of color printers and the `color` package make color separation obsolete, so it has been removed. Although the `color` has also made `\invisible` obsolete, the command is retained in the  $\text{\LaTeX} 2_{\epsilon}$  implementation, but there are a few restrictions. Invisible fonts are implemented as special shapes where the shape names are build by prefixing the normal shape name with an uppercase `I`. For example, the ‘normal invisible shape’ would be `In`. When  $\text{\LaTeX}$  is requested to typeset invisible it will thus change the current shape attribute in this manner. To make this work it is necessary that the resulting font shape group is defined. If not, the normal font substitution mechanism of  $\text{\LaTeX} 2_{\epsilon}$  will change the attribute until it finds a usable font shape group with the result that the text may become visible.

As long as you use the standard fonts for slides this is not a problem because all the visible font shape groups have invisible counterparts. However, if you decide on using special fonts, e.g., PostScript fonts, your `\DeclareFontShape` settings may not contain invisible font shape groups and thus you may be unable to use these features without adding additional `\DeclareFontShape` commands to your `.fd` files or the preamble of your document.

## 5 The Implementation

**Warning:** The implementation is still very experimental and may change internally very much. It currently basically consists of a slightly modified copy of `slides.sty` (which then forms `slides.cls`) followed by a slightly changed copy of `slitex.tex`. Documentation is practically non-existing. Everybody is invited to help changing this!

The code is divided into two parts, we first implement the class related functions and declarations and then define lowlevel stuff that is necessary within every class. By placing such commands into a separate file it will be possible to share it with other slide classes.

### 5.1 The class code

At this point we input the redefinitions that are necessary for  $\text{\LaTeX}$ .

```
1 (*class)
2 \input{slides.def}
```

Now we are ready for setting up the font tables. As usual, we first look for a local configuration file `sfonts.cfg`. If there isn’t one, we fall back to the default one (`sfonts.def`).

```
3 \InputIfFileExists{sfonts.cfg}
4     {\typeout{*****^~J%
5             *^~J%
6             * Local config file sfonts.cfg used^~J%
7             *^~J%
8             *****}}%
9     {\input{sfonts.def}}
```

## 6 Declaration of Options

We declare a few options as illegal.

## 6.1 Setting Paper Sizes

The variables `\paperwidth` and `\paperheight` should reflect the physical paper size after trimming. For desk printer output this is usually the real paper size since there is no post-processing. Classes for real book production will probably add other paper sizes and additionally the production of crop marks for trimming.

```
10 \DeclareOption{a4paper}
11   {\setlength\paperheight {297mm}%
12    \setlength\paperwidth  {210mm}}
13 \DeclareOption{a5paper}
14   {\setlength\paperheight {210mm}%
15    \setlength\paperwidth  {148mm}}
16 \DeclareOption{b5paper}
17   {\setlength\paperheight {250mm}%
18    \setlength\paperwidth  {176mm}}
19 \DeclareOption{letterpaper}
20   {\setlength\paperheight {11in}%
21    \setlength\paperwidth  {8.5in}}
22 \DeclareOption{legalpaper}
23   {\setlength\paperheight {14in}%
24    \setlength\paperwidth  {8.5in}}
25 \DeclareOption{executivepaper}
26   {\setlength\paperheight {10.5in}%
27    \setlength\paperwidth  {7.25in}}
```

The option `landscape` switches the values of `\paperheight` and `\paperwidth`, assuming the dimensions were given for portrait paper.

```
28 \DeclareOption{landscape}
29   {\setlength\@tempdima  {\paperheight}%
30    \setlength\paperheight {\paperwidth}%
31    \setlength\paperwidth  {\@tempdima}}
```

## 6.2 The clock option

The option `clock` prints the time at the bottom of each note. We also define here the commands and counters used to keep track of time.

```
32 \newif\if@clock \@clockfalse
33 \DeclareOption{clock}{\@clocktrue
34   \AtEndDocument{\typeout{\@arabic\c@minutes\space minutes}}
35 }%
36 \newcounter{minutes}%
37 \newcounter{seconds}%
38 \newcommand*{\settime}[1]{\setcounter{seconds}{0}\addtime{#1}}%
39 \newcommand*{\addtime}[1]{\addtocounter{seconds}{#1}%
40   \setcounter{minutes}{\value{seconds}}}%
41 \global \divide \value{minutes} by 60\relax
42
```

## 6.3 Two-side or one-side printing

Two-sided printing is not allowed, so don't declare an option. But it is necessary to initialize the switch.

```
43 \@twosidefalse
```

## 6.4 Draft option

If the user requests `draft` we show any overfull boxes. We could probably add some more interesting stuff to this option.

```
44 \DeclareOption{draft}{\setlength\overfullrule{5pt}}
45 \DeclareOption{final}{\setlength\overfullrule{0pt}}
```

## 6.5 Titlepage option

The default is for a `\maketitle` command to make a new page.

```
46 \newif\if@titlepage
47 \@titlepagetrue
48 \DeclareOption{titlepage}{\@titlepagetrue}
49 \DeclareOption{notitlepage}{\@titlepagefalse}
```

## 6.6 Twocolumn printing

Two-column printing is again forbidden.

```
50 \DeclareOption{onecolumn}{}
51 \DeclareOption{twocolumn}{%
52   \ClassWarning{slides}{No 'twocolumn' layout for slides}}
```

## 6.7 Equation numbering on the left

The option `leqno` can be used to get the equation numbers on the left side of the equation.

```
53 \DeclareOption{leqno}{\input{leqno.clo}}
```

## 6.8 Flush left displays

The option `fleqn` redefines the displayed math environments in such a way that they come out flush left, with an indentation of `\mathindent` from the prevailing left margin.

```
54 \DeclareOption{fleqn}{\input{fleqn.clo}}
```

# 7 Executing Options

Here we execute the default options to initialize certain variables.

```
55 \ExecuteOptions{letterpaper,final}
```

The `\ProcessOptions` command causes the execution of the code for every option `FOO` which is declared and for which the user typed the `FOO` option in his `\documentclass` command. For every option `BAR` he typed, which is not declared, the option is assumed to be a global option. All options will be passed as document options to any `\usepackage` command in the document preamble.

```
56 \ProcessOptions
```

# 8 Loading Packages

The standard class files do not load additional packages.

## 9 Document Layout

In this section we are finally dealing with the nasty typographical details.

### 9.1 Fonts

```

57 % FMi:
58 \def\rmdefault{lcmss}          % no roman
59 \def\sfdefault{lcmss}
60 \def\ttdefault{lcmtt}
61 \def\itdefault{sl}
62 \def\sldefault{sl}
63 \def\bfdefault{bx}

```

Since the number of parameters to set are very large it seems reasonable to set up one command `\@setfontsize@parms` which will do the work for us.

L<sup>A</sup>T<sub>E</sub>X offers the user commands to change the size of the font, relative to the ‘main’ size. Each relative size changing command `\size` executes the command `\@setfontsize\size<font-size><baselineskip>` where:  
`<font-size>` The absolute size of the font to use from now on.

`<baselineskip>` The normal value of `\baselineskip` for the size of the font selected. (The actual value will be `\baselinestretch * <baselineskip>`.)

A number of commands, defined in the L<sup>A</sup>T<sub>E</sub>X kernel, shorten the following definitions and are used throughout. They are:

|                      |       |                      |    |                      |      |
|----------------------|-------|----------------------|----|----------------------|------|
| <code>\@vpt</code>   | 5     | <code>\@vipt</code>  | 6  | <code>\@viipt</code> | 7    |
| <code>\@viipt</code> | 8     | <code>\@ixpt</code>  | 9  | <code>\@xpt</code>   | 10   |
| <code>\@xipt</code>  | 10.95 | <code>\@xiipt</code> | 12 | <code>\@xivpt</code> | 14.4 |
| ...                  |       |                      |    |                      |      |

`\ifourteenpt` For S<sup>L</sup>T<sub>E</sub>X, however, these are not sufficient, and we therefore need to add a few extra, larger, sizes.

```

\itwentyppt 64 \def\ifourteenpt{13.82}
\itwentyfourpt 65 \def\iseventeenpt{16.59}
\itwentyfourpt 66 \def\itwentyppt{19.907}
\itwentyfourpt 67 \def\itwentyfourpt{23.89}
\itwentyfourpt 68 \def\itwentyfourpt{28.66}
\itwentyfourpt 69 \def\itwentyfourpt{34.4}
\itwentyfourpt 70 \def\itwentyfourpt{41.28}

```

`\@setfontsize@parms` This routine is used in S<sup>L</sup>T<sub>E</sub>X to interface font size setting it is modeled after the settings I found in `slides.sty`, so it probably needs an update. But any class is free to redefine it, as it is used only as an abbreviation. It’s syntax is:

```

\@setfontsize@parms
  <lineskip>
  <parskip>
  <abovedisplayskip>
  <belowdisplayskip>
  <abovedisplayshortskip>
  <belowdisplayshortskip>
  <strut ht> <strut dp> (without pt)

```

For NFSS1 a similar style existed which did run both with a  $\text{\LaTeX}$  with old font selection or with NFSS1. But when no separate format is made this doesn't make much sense. So the following note is history and would only be true if all NFSS stuff would be removed from the file and placed into the format.

Note: To interface the old `sfonts.tex` the  $\langle size \rangle$  must be hidden in commands denoting the size by its name prefixed with 'i', i.e. 20pt size is called `\itwentyp` at this point. The NFSS interface will define those sizes to expand to the internal size, e.g. 20 but for the old `sfonts` the command name, e.g. `\itwentyp`, will be used to construct the name `\twentyp` etc.

This is a crude interface to the old `sfonts.tex`. It will be a bit slower than the old one because it must define `\@tiny` etc. every time a size changes.

If classes are set up that are only for use with NFSS then the second argument may be an ordinary font size!

```
71 \def\@setfontsize@parms#1#2#3#4#5#6#7#8{%
72   \lineskip #1\relax%
73   \parskip #2\relax
74   \abovedisplayskip #3\relax
75   \belowdisplayskip #4\relax
76   \abovedisplayshortskip #5\relax
77   \belowdisplayshortskip #6\relax
78 %
```

I don't see a reason why the `\strutbox` has a dim different from `\baselineskip` but we will leave it for the moment

```
79   \setbox\strutbox=\hbox{\vrule \@height#7\p@\@depth#8\p@\@width\z@}%
80   \baselineskip\baselinestretch\baselineskip
81   \normalbaselineskip\baselineskip}
```

Setting size relations for math scripts:

```
82 \DeclareMathSizes{13.82}{13.82}{10}{7}
83 \DeclareMathSizes{16.59}{16.59}{12}{7}
84 \DeclareMathSizes{19.907}{19.907}{16.59}{13.82}
85 \DeclareMathSizes{23.89}{23.89}{19.907}{16.59}
86 \DeclareMathSizes{28.66}{28.66}{23.89}{19.907}
87 \DeclareMathSizes{34.4}{34.4}{28.66}{23.89}
88 \DeclareMathSizes{41.28}{41.28}{34.4}{28.66}
```

`\normalsize`

```
89 \def\normalsize{%
90   \@setfontsize\normalsize\itwentyp{28\p@ plus3\p@ minus4\p@}%
91 %       {20}{30\p@ plus3\p@ minus3\p@}% made a bit shorter
92   \@setfontsize@parms
93   {2pt}%
94   {30\p@ plus18\p@ minus9\p@}%
95   {15\p@ plus3\p@ minus3\p@}%
96   {10\p@ plus3\p@ minus3\p@}%
97   {10\p@ plus3\p@}
98   \abovedisplayshortskip
99   {17}{7}}
```

We initially choose the `normalsize` font.

```
100 \normalsize
```

```

\small
101 \def\smallf{\@setfontsize\small\iseventeenpt{19\p@ plus3\p@ minus\p@}%
102         \@setfontsize@parms
103         {2\p@}%
104         {15\p@ plus15\p@ minus7\p@}%
105         {12\p@ plus3\p@ minus3\p@}%
106         {9\p@ plus3\p@ minus3\p@}%
107         {6\p@ plus3\p@}%
108         \abovedisplayshortskip
109         {13.5}{5.6}}

```

```

\footnotesize
\scriptsize 110 \let\footnotesize=\small
111 \let\scriptsize=\small

```

```

\tiny
112 \def\tinyf{\@setfontsize\tiny\ifourteenpt{16\p@ plus2\p@ minus\p@}%
113         \@setfontsize@parms
114         {2pt}%
115         {14\p@ plus3\p@ minus10\p@}%
116         {11\p@ plus3\p@ minus10\p@}%
117         \abovedisplayskip
118         {8\p@ plus3\p@ minus5\p@}%
119         {\z@ plus3\p@}%
120         {10}{4}}

```

Actually copying the code above would be better because this would correct the error message. Maybe one should remove the first argument of `\set@font@size@parms`.

```

\large
\Large 121 \def\largef{\@setfontsize\large\itwentyfourpt{42\p@ plus8\p@ minus5\p@}%
\Large 122         \@setfontsize@parms
\huge 123         {2\p@}%
\Huge 124         {40\p@ plus20\p@ minus4\p@}%
125         {20\p@ plus8\p@ minus3\p@}%
126         \abovedisplayskip
127         {10\p@ plus5\p@}%
128         \abovedisplayshortskip
129         {20}{8.5}}
130
131 \def\Largef{\@setfontsize\Large\itwenty-ninept{48\p@ plus10\p@ minus6\p@}%
132         \@setfontsize@parms
133         {2\p@}%
134         {48\p@ plus30\p@ minus6\p@}%
135         {24\p@ plus10\p@ minus6\p@}%
136         \abovedisplayskip
137         {12\p@ plus8\p@}%
138         \abovedisplayshortskip
139         {27}{11}}
140
141 \def\LARGEf{\@setfontsize\LARGE\ithirtyfourpt{52\p@ plus10\p@ minus6\p@}%
142         \@setfontsize@parms

```

```

143          {2\p@}%
144          {52\p@ plus30\p@ minus6\p@}%
145          {24\p@ plus10\p@ minus6\p@}%
146          \abovedisplayskip
147          {12\p@ plus8\p@}%
148          \abovedisplayshortskip
149          {27}{11}}
150
151 \def\huge{\@setfontsize\huge\ifortyonept{60\p@ plus10\p@ minus6\p@}%
152          \@setfontsize@parms
153          {2\p@}%
154          {60\p@ plus30\p@ minus6\p@}%
155          {24\p@ plus10\p@ minus6\p@}%
156          \abovedisplayskip
157          {12\p@ plus8\p@}%
158          \abovedisplayshortskip
159          {27}{11}}
160
161 \let\Huge\huge

```

## 9.2 Paragraphing

|                                   |   |
|-----------------------------------|---|
| <code>\baselinestretch</code>     | This is used as a multiplier for <code>\baselineskip</code> . The default is to <i>not</i> stretch the baselines. |
|                                   | 162 <code>\renewcommand\baselinestretch{}</code>  |
| <code>\parindent</code>           | <code>\parindent</code> is the width of the paragraph indentation.  |
|                                   | 163 <code>\setlength\parindent{\z@}</code>  |
| <code>\@lowpenalty</code>         | The commands <code>\nopagebreak</code> and <code>\nolinebreak</code> put in penalties to discourage               |
| <code>\@medpenalty</code>         | these breaks at the point they are put in. They use <code>\@lowpenalty</code> , <code>\@medpenalty</code>         |
| <code>\@highpenalty</code>        | or <code>\@highpenalty</code> , dependent on their argument.  |
|                                   | 164 <code>\@lowpenalty 51</code>  |
|                                   | 165 <code>\@medpenalty 151</code>   |
|                                   | 166 <code>\@highpenalty 301</code>  |
| <code>\clubpenalty</code>         | These penalties are use to discourage club and widow lines. Because we use their                                  |
| <code>\widowpenalty</code>        | default values we only show them here, commented out.   |
|                                   | 167 % <code>\clubpenalty 150</code>   |
|                                   | 168 % <code>\widowpenalty 150</code>  |
| <code>\displaywidowpenalty</code> | Discourage (but not so much) widows in front of a math display and forbid   |
| <code>\predisplaypenalty</code>   | breaking directly in front of a display. Allow break after a display without a                                    |
| <code>\postdisplaypenalty</code>  | penalty. Again the default values are used, therefore we only show them here.                                     |
|                                   | 169 % <code>\displaywidowpenalty 50</code>  |
|                                   | 170 % <code>\predisplaypenalty 10000</code>   |
|                                   | 171 % <code>\postdisplaypenalty 0</code>  |
| <code>\interlinepenalty</code>    | Allow the breaking of a page in the middle of a paragraph.  |
|                                   | 172 % <code>\interlinepenalty 0</code>  |
| <code>\brokenpenalty</code>       | We allow the breaking of a page after a hyphenated line.  |
|                                   | 173 % <code>\brokenpenalty 0</code>   |



## 9.3 Page Layout

All margin dimensions are measured from a point one inch from the top and lefthand side of the page.

### 9.3.1 Vertical spacing

`\headheight` The `\headheight` is the height of the box that will contain the running head. The  
`\headsep` `\headsep` is the distance between the bottom of the running head and the top of  
`\topskip` the text. `\topskip` is the `\baselineskip` for the first line on a page.

```
174 \setlength\headheight{14\p@}
175 \setlength\headsep    {15\p@}
176 \setlength\topskip    {30\p@}
```

`\footskip` The distance from the baseline of the box which contains the running footer to  
the baseline of last line of text is controlled by the `\footskip`. Bottom of page:

```
177 \setlength\footskip{25\p@}    %
```

`\maxdepth` The `\TeX` primitive register `\maxdepth` has a function that is similar to that of  
`\@maxdepth` `\topskip`. The register `\@maxdepth` should always contain a copy of `\maxdepth`.  
In both plain `\TeX` and `\LaTeX` 2.09 `\maxdepth` had a fixed value of 4pt; in native  
`\LaTeX`2e mode we let the value depend on the typesize. We set it so that `\maxdepth`  
+ `\topskip` = typesize  $\times$  1.5. As it happens, in these classes `\topskip` is equal  
to the typesize, therefor we set `\maxdepth` to half the value of `\topskip`.

```
178 \ifcompatibility
179   \setlength\maxdepth{4\p@}
180 \else
181   \setlength\maxdepth{.5\topskip}
182 \fi
183 \setlength\@maxdepth\maxdepth
```

### 9.3.2 The dimension of text

`\textwidth` When we are in compatibility mode we have to make sure that the dimensions of  
the printed area are not different from what the user was used to see.

```
184 \ifcompatibility
185   \setlength\textwidth{460\p@}
```

When we are not in compatibility mode we can set some of the dimensions differently, taking into account the paper size for instance.

```
186 \else
```

First, we calculate the maximum `textwidth`, which depends on the papersize. Then we calculate the approximate length of 65 characters, which should be the maximum length of a line of text. The calculated values are stored in `\@tempdima` and `\@tempdimb`.

```
187   \setlength\@tempdima{\paperwidth}
188   \addtolength\@tempdima{-2in}
189   \setbox\@tempboxa\hbox{\rmfamily im}
190   \setlength\@tempdimb{.5\wd\@tempboxa}
191   \setlength\@tempdimb{65\@tempdimb}
```

Now we can set the `\textwidth`, depending on whether we will be setting one or two columns.

The text should not be wider than the minimum of the paperwidth (minus 2 inches for the margins) and the maximum length of a line as defined by the number of characters.

```
192 \ifdim\@tempdima>\@tempdimb\relax
193   \setlength\textwidth{\@tempdimb}
194 \else
195   \setlength\textwidth{\@tempdima}
196 \fi
197 \fi
```

Here we modify the width of the text a little to be a whole number of points.

```
198 \@settopoint\textwidth
```

```
\columnwidth
\columnsep 199 \columnwidth \textwidth
\columnseprule 200 \columnsep 10pt
201 \columnseprule \z@
```

`\textheight` Now that we have computed the width of the text, we have to take care of the height. The `\textheight` is the height of text (including footnotes and figures, excluding running head and foot).

First make sure that the compatibility mode gets the same dimensions as we had with L<sup>A</sup>T<sub>E</sub>X2.09. The number of lines was calculated as the floor of the old `\textheight` minus `\topskip`, divided by `\baselineskip` for `\normalsize`. The old value of `\textheight` was 528pt.

```
202 \if@compatibility
203   \setlength\textheight{600\p@}
```

Again we compute this, depending on the papersize and depending on the `\baselineskip` that is used, in order to have a whole number of lines on the page.

```
204 \else
205   \setlength\@tempdima{\paperheight}
```

We leave at least a 1 inch margin on the top and the bottom of the page.

```
206 \addtolength\@tempdima{-2in}
```

We also have to leave room for the running headers and footers.

```
207 \addtolength\@tempdima{-1in}
```

Then we divide the result by the current `\baselineskip` and store this in the count register `\@tempcnta`, which then contains the number of lines that fit on this page.

```
208 \divide\@tempdima\baselineskip
209 \@tempcnta=\@tempdima
```

From this we can calculate the height of the text.

```
210 \setlength\textheight{\@tempcnta\baselineskip}
211 \fi
```

The first line on the page has a height of `\topskip`.

```
212 \advance\textheight by \topskip
```

### 9.3.3 Margins

`\oddsidemargin` First we give the values for the compatibility mode.  
`\evensidemargin` Values for two-sided printing:  
`\marginparwidth`

```
213 \ifcompatibility
214   \setlength\oddsidemargin {17\p@}
215   \setlength\evensidemargin {17\p@}
216   \setlength\marginparwidth {20\p@}
217 \else
```

When we are not in compatibility mode we can take the dimensions of the selected paper into account.

We center the text on the page, by calculating the difference between `textwidth` and `\paperwidth-2in`. Half of that difference is then used for the margin. The amount of space that can be used for marginal notes is at least 0.8 inch, to which we add any ‘leftover’ space.

```
218   \setlength\@tempdima {\paperwidth}
219   \addtolength\@tempdima {-2in}
220   \addtolength\@tempdima {-\textwidth}
221   \setlength\oddsidemargin {.5\@tempdima}
222   \setlength\marginparwidth {.8in}
223   \addtolength\marginparwidth {.5\@tempdima}
```

The `\evensidemargin` can now be computed from the values set above.

```
224 \setlength\evensidemargin {\paperwidth}
225 \addtolength\evensidemargin{-2in}
226 \addtolength\evensidemargin{-\textwidth}
227 \addtolength\evensidemargin{-\oddsidemargin}
228 \fi
```

`\marginparsep` The horizontal space between the main text and marginal notes is determined by  
`\marginparpush` `\marginparsep`, the minimum vertical separation between two marginal notes is controlled by `\marginparpush`.

```
229 \setlength\marginparsep {5\p@}
230 \setlength\marginparpush{5\p@}
```

`\topmargin` The `\topmargin` is the distance between the top of ‘the printable area’ –which is 1 inch below the top of the paper– and the top of the box which contains the running head.

It can now be computed from the values set above.

```
231 \ifcompatibility
232   \setlength\topmargin{-10pt}
233 \else
234   \setlength\topmargin{\paperheight}
235   \addtolength\topmargin{-2in}
236   \addtolength\topmargin{-\headheight}
237   \addtolength\topmargin{-\headsep}
238   \addtolength\topmargin{-\textheight}
239   \addtolength\topmargin{-\footskip}      % this might be wrong!
```

By changing the factor in the next line the complete page can be shifted vertically.

```
240   \addtolength\topmargin{-.5\topmargin}
241 \fi
242 \@settopoint\topmargin
```

### 9.3.4 Footnotes

`\footnotesep` `\footnotesep` is the height of the strut placed at the beginning of every footnote. It equals the height of a normal `\footnotesize` strut in this class, thus no extra space occurs between footnotes.

```
243 \setlength\footnotesep{20\p@}
```

`\footins` `\skip\footins` is the space between the last line of the main text and the top of the first footnote.

```
244 \setlength{\skip\footins}{10\p@ \@plus 2\p@ \@minus 4\p@}
```

## 9.4 Page Styles

The page style *foo* is defined by defining the command `\ps@foo`. This command should make only local definitions. There should be no stray spaces in the definition, since they could lead to mysterious extra spaces in the output (well, that's something that should be always avoided).

`\@evenhead` The `\ps@...` command defines the macros `\@oddhead`, `\@oddfoot`, `\@evenhead`, `\@oddhead` and `\@evenfoot` to define the running heads and feet—e.g., `\@oddhead` is the macro to produce the contents of the heading box for odd-numbered pages. It is called inside an `\hbox` of width `\textwidth`.

The page styles of slides is determined by the 'slide' page style, the slide environment executing a `\thispagestyle{slide}` command. The page styles of overlays and notes are similarly determined by 'overlay' and 'note' page styles. The command standard 'headings', 'plain' and 'empty' page styles work by redefining the 'slide', 'overlay', and 'note' styles.

`\ps@headings`

```
245 \if@compatibility
246 \def\ps@headings{%
247 \def\ps@slide{\def\@oddfoot{\@mainsize +\hfil\hb@xt@3em{\theslide
248                                         \hss}}%
249 \def\@oddhead{\@mainsize +\hfil +}%
250 \def\@evenfoot{\@mainsize +\hfil\hb@xt@3em{\theslide\hss}}%
251 \def\@evenhead{\@mainsize +\hfil +}}
252
253 \def\ps@overlay{\def\@oddfoot{\@mainsize +\hfil\hb@xt@3em{\theoverlay
254                                         \hss}}%
255 \def\@oddhead{\@mainsize +\hfil +}%
256 \def\@evenfoot{\@mainsize +\hfil\hb@xt@3em{\theoverlay\hss}}%
257 \def\@evenhead{\@mainsize +\hfil +}}
258 \def\ps@note{\def\@oddfoot{\@mainsize \hbox{}\hfil\thenote}%
259 \def\@oddhead{}%
260 \def\@evenfoot{\@mainsize \hbox{}\hfil\thenote}%
261 \def\@evenhead{}}
262 %
263 \else %%if@compatibility
264 %
265 \def\ps@headings{%
266 \def\ps@slide{%
267 \def\@oddfoot{\@mainsize \mbox{}\hfil\hb@xt@3em{\theslide\hss}}%
```

```

268 \def\@oddhead{}%
269 \def\@evenfoot{\@mainsize \mbox{}\hfil\hb@xt@3em{\theslide\hss}}%
270 \def\@evenhead{}}
271
272 \def\ps@overlay{%
273 \def\@oddfoot{\@mainsize \mbox{}\hfil\hb@xt@3em{\theoverlay\hss}}%
274 \def\@oddhead{}%
275 \def\@evenfoot{\@mainsize \mbox{}\hfil\hb@xt@3em{\theoverlay\hss}}%
276 \def\@evenhead{}}
277
278 \def\ps@note{%
279 \def\@oddfoot{%
280 \@mainsize
281 \if@clock
282 \fbox{\large \@arabic\c@minutes\space min}%
283 \else
284 \null
285 \fi
286 \hfil\thenote}%
287 \def\@oddhead{}%
288 \def\@evenfoot{%
289 \@mainsize
290 \if@clock
291 \fbox{\large \@arabic\c@minutes\space min}%
292 \else
293 \null
294 \fi
295 \hfil\thenote}%
296 \def\@evenhead{}}
297 \fi %% if@compatibility

```

\ps@plain

```

298 \def\ps@plain{\def\ps@slide{%
299 \def\@oddfoot{\@mainsize \mbox{}\hfil\hb@xt@3em{\theslide\hss}}%
300 \def\@oddhead{}%
301 \def\@evenfoot{\@mainsize \mbox{}\hfil\hb@xt@3em{\theslide\hss}}%
302 \def\@evenhead{}}
303 \def\ps@overlay{\def\@oddfoot{\@mainsize
304 \mbox{}\hfil\hb@xt@3em{\theoverlay\hss}}%
305 \def\@oddhead{}%
306 \def\@evenfoot{\@mainsize \mbox{}\hfil\hb@xt@3em{\theoverlay\hss}}%
307 \def\@evenhead{}}
308 \def\ps@note{\def\@oddfoot{\@mainsize \hbox{}\hfil\thenote}%
309 \def\@oddhead{}%
310 \def\@evenfoot{\@mainsize \hbox{}\hfil\thenote}%
311 \def\@evenhead{}}

```

\ps@empty

```

312 \def\ps@empty{%
313 \def\ps@slide{\def\@oddhead{}\def\@oddfoot{}%
314 \def\@evenhead{}\def\@evenfoot{}}%
315 \def\ps@overlay{\def\@oddhead{}\def\@oddfoot{}%
316 \def\@evenhead{}\def\@evenfoot{}}%
317 \def\ps@note{\def\@oddhead{}\def\@oddfoot{}%

```

```
318 \def\@evenhead{}\def\@evenfoot{}}
```

Default definition the 'slide', 'overlay', and 'note' page styles.

```
319 \ps@headings
```

Set ordinary page style to 'empty'

```
320 \let\@oddhead\@empty\let\@oddfoot\@empty
```

```
321 \let\@evenhead\@empty\let\@evenfoot\@empty
```

## 9.5 Providing math *versions*

L<sup>A</sup>T<sub>E</sub>X provides two *versions*. We call them **normal** and **bold**, respectively. S<sup>U</sup>T<sub>E</sub>X does not have a **bold** version. But we treat the invisible characters as a version. The only thing we have to take care of is to ensure that we have exactly the same fonts in both versions available.

```
322 \DeclareMathVersion{invisible}
```

Now we define the basic *math groups* used by L<sup>A</sup>T<sub>E</sub>X. Later on, in packages some other *math groups*, e.g., the AMS symbol fonts, will be defined.

As a default I used serif fonts for mathgroup 0 to get things like `\log` look right.

```
323 \SetSymbolFont{operators}{normal}
324           {OT1}{lcmss}{m}{n}
```

```
325
```

```
326 \SetSymbolFont{letters}{normal}
327           {OML}{lcm}{m}{it}
```

```
328 \SetSymbolFont{symbols}{normal}
329           {OMS}{lcm}{m}{n}
```

```
330 \SetSymbolFont{largesymbols}{normal}
331           {OMX}{lcm}{m}{n}
```

```
332
```

```
333 \SetSymbolFont{operators}{invisible}
334           {OT1}{lcmss}{m}{In}
```

```
335 \SetSymbolFont{letters}{invisible}
336           {OML}{lcm}{m}{Iit}
```

```
337 \SetSymbolFont{symbols}{invisible}
338           {OMS}{lcm}{m}{In}
```

```
339 \SetSymbolFont{largesymbols}{invisible}
340           {OMX}{lcm}{m}{In}
```

```
341
```

```
342
```

```
343 \def\@mainsize{\visible\tiny}
```

## 9.6 Environments

**titlepage** This environment starts a new page, with pagestyle *empty* and sets the page counter to 0.

```
344 \newenvironment{titlepage}
345   {\newpage
346     \thispagestyle{empty}%
347     \setcounter{page}{\z@}}
348   {\newpage}
```

### 9.6.1 General List Parameters

The following commands are used to set the default values for the list environment's parameters. See the L<sup>A</sup>T<sub>E</sub>X manual for an explanation of the meaning of the parameters.

```

\leftmargini
\leftmarginii 349 \setlength\leftmargini {38\p@}
\leftmarginiii 350 \setlength\leftmarginii {30\p@}
\leftmarginiv 351 \setlength\leftmarginiii {20\p@}
\leftmarginv 352 \setlength\leftmarginiv {15\p@}
\leftmarginvi 353 \setlength\leftmarginv {15\p@}
               354 \setlength\leftmarginvi {10\p@}

\@listi These commands set the values of \leftmargin, \parsep, \topsep, and \itemsep
\@listii for the various levels of lists. It is even necessary to initialize \leftmargin in
\@listiii \@listi, i.e. for a level one list, as a list environment may appear inside a
\@listiv trivlist, for example inside a theorem environment.
\@listv 355 \def\@listi{\leftmargin\leftmargini
\@listvi 356 \parsep .5\parskip
          357 \topsep \parsep
          358 \itemsep\parskip
          359 \partopsep \z@}
          360
          361 \def\@listii{\leftmargin\leftmarginii
          362 \labelwidth\leftmarginii
          363 \advance\labelwidth-\labelsep
          364 \parsep .5\parskip
          365 \topsep \parsep
          366 \itemsep\parskip}
          367 \def\@listiii{\leftmargin\leftmarginiii
          368 \labelwidth\leftmarginiii
          369 \advance\labelwidth-\labelsep}
          370 \def\@listiv{\leftmargin\leftmarginiv
          371 \labelwidth\leftmarginiv
          372 \advance\labelwidth-\labelsep}
          373 \def\@listv{\leftmargin\leftmarginv
          374 \labelwidth\leftmarginv
          375 \advance\labelwidth-\labelsep}
          376 \def\@listvi{\leftmargin\leftmarginvi
          377 \labelwidth\leftmarginvi
          378 \advance\labelwidth-\labelsep}

Here we initialize \leftmargin and \labelwidth.
379 \leftmargin\leftmargini
380 \labelwidth\leftmargini\advance\labelwidth-\labelsep

```

### 9.6.2 Paragraph-formatting environments

**verse** Inside a **verse** environment, `\\` ends a line, and line continuations are indented further. A blank line makes new paragraph with `\parskip` space.

```

381 \newenvironment{verse}{\let\\=\@centercr
382 \list{}{\itemsep \z@}

```

```

383 \itemindent -15\p@
384 \listparindent \itemindent
385 \rightmargin \leftmargin
386 \advance\leftmargin 15\p@}%
387 \item[]
388 {\endlist}

```

**quotation** The `quotation` environment fills lines, indents paragraphs.

```

389 \newenvironment{quotation}{\list{}{\listparindent 20\p@
390 \itemindent\listparindent
391 \rightmargin\leftmargin}%
392 \item[]
393 {\endlist}

```

**quote** The `quote` environment is the same as the `quotation` environment, except that there is no paragraph indentation.

```

394 \newenvironment{quote}{\list{}{\rightmargin\leftmargin}\item[]
395 {\endlist}

```

### 9.6.3 List-making environments

**description** The `description` environment is defined here – while the `itemize` and `enumerate` environments are defined in `latex.dtx`.

```

396 \newenvironment{description}{\list{}{\labelwidth\z@
397 \itemindent-\leftmargin
398 \let\makelabel\descriptionlabel}}
399 {\endlist}

```

**\descriptionlabel** To change the formatting of the label, you must redefine `\descriptionlabel`.

```

400 \newcommand*{\descriptionlabel}[1]{\hspace\labelsep
401 \normalfont\bfseries #1}
402

```

### 9.6.4 Enumerate

The `enumerate` environment uses four counters: *enumi*, *enumii*, *enumiii* and *enumiv*, where *enumN* controls the numbering of the Nth level enumeration.

**\theenumi** The counters are already defined in `latex.dtx`, but their representation is changed here.

```

\theenumii
\theenumiii
\theenumiv
403 \renewcommand\theenumi{\@arabic\c@enumi}
404 \renewcommand\theenumii{\@alph\c@enumii}
405 \renewcommand\theenumiii{\@roman\c@enumiii}
406 \renewcommand\theenumiv{\@Alph\c@enumiv}

```

**\labelenumi** The label for each item is generated by the four commands `\labelenumi` ...

```

\labelenumii \labelenumiv.
\labelenumiii
\labelenumiv
407 \newcommand\labelenumi{\theenumi.}
408 \newcommand\labelenumii{(\theenumii)}
409 \newcommand\labelenumiii{\theenumiii.}
410 \newcommand\labelenumiv{\theenumiv.}

```



`\p@enumii` The expansion of `\p@enumN\theenumN` defines the output of a `\ref` command when referencing an item of the Nth level of an enumerated list.

`\p@enumiii`

`\p@enumiv` 411 `\renewcommand\p@enumii{\theenumi}`  
 412 `\renewcommand\p@enumiii{\theenumi(\theenumii)}`  
 413 `\renewcommand\p@enumiv{\p@enumiii\theenumiii}`

### 9.6.5 Itemize

`\labelitemi` Itemization is controlled by four commands: `\labelitemi`, `\labelitemii`, `\labelitemiii`, and `\labelitemiv`, which define the labels of the various itemization levels.

`\labelitemiv` 414 `\newcommand\labelitemi{$\m@th\bullet$}`  
 415 `\newcommand\labelitemii{\normalfont\bfseries \textendash}`  
 416 `\newcommand\labelitemiii{$\m@th\ast$}`  
 417 `\newcommand\labelitemiv{$\m@th\cdot$}`

## 9.7 Setting parameters for existing environments

### 9.7.1 Array and tabular

`\arraycolsep` The columns in an array environment are separated by `2\arraycolsep`. Array and tabular environment parameters

418 `\setlength\arraycolsep{8\p@}`

`\tabcolsep` The columns in an tabular environment are separated by `2\tabcolsep`.

419 `\setlength\tabcolsep{10\p@}`

`\arrayrulewidth` The width of rules in the array and tabular environments is given by the length parameter `\arrayrulewidth`.

420 `\setlength\arrayrulewidth{.6\p@}`

`\doublerulesep` The space between adjacent rules in the array and tabular environments is given by `\doublerulesep`.

421 `\setlength\doublerulesep{3\p@}`

### 9.7.2 Tabbing

`\tabbingsep` This controls the space that the `\'` command puts in. (See L<sup>A</sup>T<sub>E</sub>X manual for an explanation.)

422 `\labelsep 10pt`  
 423 `\setlength\tabbingsep{\labelsep}`

### 9.7.3 Minipage

`\@minipagerestore` The macro `\@minipagerestore` is called upon entry to a minipage environment to set up things that are to be handled differently inside a minipage environment. In the current styles, it does nothing.

`\@mpfootins` Minipages have their own footnotes; `\skip\@mpfootins` plays same rôle for footnotes in a minipage as `\skip\footins` does for ordinary footnotes.

424 `\skip\@mpfootins = \skip\footins`

### 9.7.4 Framed boxes

|                           |   |
|---------------------------|---|
| <code>\fboxsep</code>     | The space left by <code>\fbox</code> and <code>\framebox</code> between the box and the text in it.   |
| <code>\fboxrule</code>    | The width of the rules in the box made by <code>\fbox</code> and <code>\framebox</code> .<br>425 <code>\setlength\fboxsep{5\p@}</code><br>426 <code>\setlength\fboxrule{.6\p@}</code> |
| <code>\theequation</code> | The equation number will be typeset as arabic numerals.<br>427 <code>\def\theequation{\@arabic\c@equation}</code>   |
| <code>\jot</code>         | <code>\jot</code> is the extra space added between lines of an <code>eqnarray</code> environment. The default value is used.<br>428 <code>% \setlength\jot{3pt}</code>                |
| <code>\@eqnnum</code>     | The macro <code>\@eqnnum</code> defines how equation numbers are to appear in equations. Again the default is used.<br>429 <code>% \def\@eqnnum{(\theequation)}</code>                |

## 9.8 Font changing

Here we supply the declarative font changing commands that were common in L<sup>A</sup>T<sub>E</sub>X version 2.09 and earlier. These commands work in text mode *and* in math mode. They are provided for compatibility, but one should start using the `\text...` and `\math...` commands instead. These commands are redefined using `\DeclareOldFontCommand`, a command with three arguments: the user command to be defined, L<sup>A</sup>T<sub>E</sub>X commands to execute in text mode and L<sup>A</sup>T<sub>E</sub>X commands to execute in math mode.

|                   |  |
|-------------------|--|
| <code>\rm</code>  | The commands to change the family. When in compatibility mode we select the  |
| <code>\tt</code>  | ‘default’ font first, to get L <sup>A</sup> T <sub>E</sub> X 2.09 behaviour.   |
| <code>\sf</code>  | 430 <code>\DeclareOldFontCommand{\rm}{\normalfont\rmfamily}{\mathrm}</code><br>431 <code>\DeclareOldFontCommand{\sf}{\normalfont\sffamily}{\mathsf}</code><br>432 <code>\DeclareOldFontCommand{\tt}{\normalfont\ttfamily}{\mathtt}</code>  |
| <code>\bf</code>  | The command to change to the bold series. One should use <code>\mdseries</code> to explicitly switch back to medium series.<br>433 <code>\DeclareOldFontCommand{\bf}{\normalfont\bfseries}{\mathbf}</code>   |
| <code>\sl</code>  | And the commands to change the shape of the font. The slanted and small caps   |
| <code>\it</code>  | shapes are not available by default as math alphabets, so those changes do nothing   |
| <code>\sc</code>  | in math mode. One should use <code>\upshape</code> to explicitly change back to the upright shape.<br>434 <code>\DeclareOldFontCommand{\it}{\normalfont\itshape}{\mathit}</code><br>435 <code>\DeclareOldFontCommand{\sl}{\normalfont\slshape}{\relax}</code><br>436 <code>\DeclareOldFontCommand{\sc}{\normalfont\scshape}{\relax}</code> |
| <code>\cal</code> | The commands <code>\cal</code> and <code>\mit</code> should only be used in math mode, outside math  |
| <code>\mit</code> | mode they have no effect. Currently the New Font Selection Scheme defines these commands to generate warning messages. Therefore we have to define them ‘by hand’.<br>437 <code>\DeclareRobustCommand*\cal{\@fontswitch{\relax}{\mathcal}}</code><br>438 <code>\DeclareRobustCommand*\mit{\@fontswitch{\relax}{\mathnormal}}</code>        |

## 9.9 Footnotes

`\footnoterule` Usually, footnotes are separated from the main body of the text by a small rule. This rule is drawn by the macro `\footnoterule`. We have to make sure that the rule takes no vertical space (see `plain.tex`). The resulting rule will appear on all color layers, so it's best not to draw a rule.

```
439 \renewcommand\footnoterule{}
440 % \let \footnoterule = \relax
```

`\c@footnote` Footnotes are numbered within slides, overlays, and notes and numbered with \*, †, etc.

```
\thefootnote
441 % \newcounter{footnote}
442 \def\thefootnote{\fnsymbol{footnote}}
443 \@addtoreset{footnote}{slide}
444 \@addtoreset{footnote}{overlay}
445 \@addtoreset{footnote}{note}
```

`\@makefnmark` The footnote mechanism of L<sup>A</sup>T<sub>E</sub>X calls the macro `\@makefnmark` to produce the actual footnote. The macro gets the text of the footnote as its argument and should use `\@makefnmark` to produce the mark of the footnote. The macro `\@makefnmark` is called when effectively inside a `\parbox` of width `\columnwidth` (i.e., with `\hsize = \columnwidth`).

An example of what can be achieved is given by the following piece of T<sub>E</sub>X code.

```
\long\def\@makefnmark#1{%
  \setpar{\@par
    \@tempdima = \hsize
    \advance\@tempdima-10pt
    \parshape \@ne 10pt \@tempdima}%
  \par
  \parindent 1em\noindent
  \hbox to \z@{\hss\@makefnmark}#1}
```

The effect of this definition is that all lines of the footnote are indented by 10pt, while the first line of a new paragraph is indented by 1em. To change these dimensions, just substitute the desired value for ‘10pt’ (in both places) or ‘1em’. The mark is flushright against the footnote.

In these document classes we use a simpler macro, in which the footnote text is set like an ordinary text paragraph, with no indentation except on the first line of a paragraph, and the first line of the footnote. Thus, all the macro must do is set `\parindent` to the appropriate value for succeeding paragraphs and put the proper indentation before the mark.

```
446 \long\def\@makefnmark#1{
447   \noindent
448   \hangindent 10\p@
449   \hb@xt@10\p@{\hss\@makefnmark}#1}
```

`\@makefnmark` The footnote markers that are printed in the text to point to the footnotes should be produced by the macro `\@makefnmark`. We use the default definition for it.

```
450 %\def\@makefnmark{\hbox{$^{\@thefnmark}\m@th$}}
```

## 9.10 The title

The commands `\title`, `\author`, and `\date` are already defined, so here we just define `\maketitle`.

```
451 \newcommand\maketitle{{\centering {\Large \@title \par}%  
452      \@author \par \@date\par}%  
453      \if@titlepage \break \fi}
```

## 10 Initialisation

### 10.1 Date

`\today` This macro uses the TeX primitives `\month`, `\day` and `\year` to provide the date of the L<sup>A</sup>T<sub>E</sub>X-run.

```
454 \newcommand\today{\ifcase\month\or  
455   January\or February\or March\or April\or May\or June\or  
456   July\or August\or September\or October\or November\or December\fi  
457   \space\number\day, \number\year}
```

Default initializations

```
458 \pagenumbering{arabic}  
459 \onecolumn  
460 \</class>
```

### 10.2 Basic code

The code below is basically a copy of `slitex.tex` with some changes.

Global changes so far:

#### 10.2.1 Hacks for slide macros

```
461 \*cmd  
462 \message{hacks,}  
463  
464 \outer\def\newifG#1{\count@\escapechar \escapechar\m@ne  
465   \expandafter\expandafter\expandafter  
466   \edef\@ifG#1{true}{\global\let\noexpand#1\noexpand\iftrue}%  
467   \expandafter\expandafter\expandafter  
468   \edef\@ifG#1{false}{\global\let\noexpand#1\noexpand\iffalse}%  
469   \@ifG#1{false}\escapechar\count@} % the condition starts out false  
470 \def\@ifG#1#2{\csname\expandafter\ifG@\string#1#2\endcsname}  
471 {\uccode'1='i \uccode'2='f \uccode'3='G \uppercase{\gdef\ifG@123{G}}}  
472 % 'ifG' is required  
473  
474 \def\@gobbletoend#1{\def\@argend{#1}\@ggobtoend}  
475  
476 \long\def\@ggobtoend#1\end#2{\fi\def\reserved@a{#2}%  
477 \ifx\reserved@a\@argend\else\@ggobtoend\fi}
```

FMi: I don't see any reason for this command since `\fi` is hidden anyway in the replacement text `\def\@xfi{\fi}`

```
478 \message{slides,}
```

## 10.2.2 Slide macros

Switches:

`@bw` true if making black and white slides  
`@visible` true if visible output to be produced.  
`@makingslides` true if making a slide/overlay/note

```
479 \newif\if@bw
480 \newif\if@visible
481 \newif\if@onlyslidesw \@onlyslideswfalse
482 \newif\if@onlynotesw \@onlynoteswfalse
483 \newif\if@makingslides
```

FMi: `\newifG` replaces `\gdef\@slidesw{T}` stuff

```
484 \newifG\ifG@slidesw
```

Counters

`slide` slide number  
`overlay` overlay number for a slide  
`note` note number for a slide

```
485 \countdef\c@slide=0 \c@slide=0
486 \def\cl@slide{}
487 \countdef\c@overlay=1 \c@overlay=0
488 \def\cl@overlay{}
489 \countdef\c@note=2 \c@note=0
490 \def\cl@note{}
```

Add these counters explicitly to the ‘ckpt list’ so that the `\include` mechanism works.

```
491 \g@addto@macro\cl@ckpt{\@elt{slide}\@elt{overlay}\@elt{note}}
492 \@addtoreset{overlay}{slide}
493 \@addtoreset{note}{slide}
```

Redefine page counter to some other number. The page counter will always be zero except when putting out an extra page for a slide, note or overlay.

```
494 \definecounter{page}
495 \@addtoreset{page}{slide}
496 \@addtoreset{page}{note}
497 \@addtoreset{page}{overlay}
498
499 \def\theslide{\@arabic\c@slide}
500 \def\theoverlay{\theslide-\@alph\c@overlay}
501 \def\thenote{\theslide-\@arabic\c@note}
```

`\@setlimits \LIST \LOW \HIGH`

Assumes that `\LIST = RANGE1,RANGE2,...,RANGEn` ( $n > 0$ )  
Where  $RANGE_i = j$  or  $j-k$ .

Then `\@setlimits` globally sets

(i) `\LIST := RANGE2, ... , RANGEn`  
(ii) `\LOW := p`  
(iii) `\HIGH := q`

where either  $RANGE_1 = p-q$  or  $RANGE_1 = p$  and  $q=p$ .

```

502 \def\@sl@getargs#1-#2-#3\relax#4#5{\xdef#4{#1}\xdef#5{#2}}
503 \def\@sl@ccdr#1,#2\relax#3#4{\xdef#3{#1-#1-}\xdef#4{#2}}
504
505 \def\@setlimits #1#2#3{\expandafter\@sl@ccdr#1\relax\@sl@gtmp #1%
506 \expandafter\@sl@getargs\@sl@gtmp\relax#2#3}

\onlyslides{LIST} ::=
BEGIN
  @onlyslidesw := true
  \@doglslidelist :=G LIST,999999,999999
  if @onlynotesw = true
    else @onlynotesw := true
      \@doglnotelist :=G LIST,999999,999999
  fi
  message: Only Slides LIST
END

507 \def\onlyslides#1{\@onlyslideswtrue
508   \gdef\@doglslidelist{#1,999999,999999}%
509   \if@onlynotesw \else
510     \@onlynoteswtrue\gdef\@doglnotelist{999999,999999}\fi
511   \typeout{Only Slides #1}}

\onlynotes{LIST} ::=
BEGIN
  @onlynotesw := true
  \@doglnotelist :=G LIST,999999,999999
  if @onlyslidesw = true
    else \@onlyslidesw := true
      \@doglslidelist{999999,999999}
  fi
  message: Only Notes LIST
END

512 \def\onlynotes#1{\@onlynoteswtrue
513   \gdef\@doglnotelist{#1,999999,999999}%
514   \if@onlyslidesw \else
515     \@onlyslideswtrue\gdef\@doglslidelist{999999,999999}\fi
516   \typeout{Only Notes #1}}

\setupcounters ::= (similar to old \blackandwhite #1 ::= )
\newpage
page counter := 0
@bw := T
@visible := T
if @onlyslidesw = true
  then \@doslidelist := \@doglslidelist
    \@setlimits\@doslidelist\@doslidelow\@doslidehigh
fi
if @onlynotesw = true
  then \@donotelist := \@doglnotelist
    \@setlimits\@donotelist\@donotelow\@donotehigh
fi
\normalsize % Note, this sets font to \rmfamily , which sets
             % \@currfont to \rmfamily

```

```

counter slidenumner := 0
counter note        := 0
counter overlay     := 0
@makingslides       := F   %% \blackandwhite: @makingslides := T
                        %%                               input #1
                        %%                               @makingslides := F

517 \if@compatibility
518 % In compatibility mode, need to define \verb+\blackandwhite+,
519 % \verb+\color+, \verb+\colorslides+, etc.
520 \def\blackandwhite#1{\newpage\setcounter{page}{0}\@bwtrue\@visibletrue
521 \if@onlyslidesw \xdef\@doslidelist{\@doglslidelist}%
522 \setlimits\@doslidelist\@doslidelow\@doslidehigh\fi
523 \if@onlynotesw \xdef\@donotelist{\@doglnotelist}%
524 \setlimits\@donotelist\@donotelow\@donotehigh\fi
525 \normalsize\setcounter{slide}{0}\setcounter{overlay}{0}%
526 \setcounter{note}{0}\@makingslidestrue\input #1\@makingslidesfalse}

\colors{COLORS} ::=
  for \@colortemp := COLORS
    do \csname \@colortemp \endcsname == \@color{\@colortemp} od
  if \@colorlist = empty
    then \@colorlist := COLORS
    else \@colorlist := \@colorlist , COLORS
  fi

527 \def\colors#1{\@for\@colortemp:=#1\do{\expandafter
528   \xdef\csname\@colortemp\endcsname{\noexpand\@color{\@colortemp}}}\ifx
529   \@colorlist\@empty \gdef\@colorlist{#1}%
530   \else \xdef\@colorlist{\@colorlist,#1}\fi}
531
532 \def\@colorlist{}

\colorslides{FILE} ::=
  \newpage
  page counter := 0
  @bw := F
  for \@currcolor := \@colorlist
    do @visible := T
      if @onlyslidesw = true
        then \@doslidelist := \@doglslidelist
          \setlimits\@doslidelist\@doslidelow\@doslidehigh
        fi
      if @onlynotesw = true
        then \@donotelist := \@doglnotelist
          \setlimits\@donotelist\@donotelow\@donotehigh
        fi
      \normalsize
      counter slide := 0
      counter overlay := 0
      counter note := 0
      type message
      generate color layer output page
      @makingslides := T
      input #1

```

```

        @makingslides := F
    od

533 \def\colorslides#1{\newpage\setcounter{page}{0}\@bwfalse
534 \@for\@currcolor:=\@colorlist\do
535 {\@visibletrue
536 \ifonlyslidesw \xdef\@doslidelist{\@doglslidelist}%
537 \@setlimits\@doslidelist\@doslidelow\@doslidehigh\fi
538 \ifonlynotesw \xdef\@donotelist{\@doglnotelist}%
539 \@setlimits\@donotelist\@donotelow\@donotehigh\fi
540 \normalsize\setcounter{slide}{0}\setcounter{overlay}{0}%
541 \setcounter{note}{0}\typeout{color \@currcolor}%
542 \newpage
543 \begin{huge}%
544 \begin{center}%
545 COLOR LAYER\[\.75in]%
546 \@currcolor
547 \end{center}%
548 \end{huge}%
549 \newpage
550 \@makingslidestrue
551 \input #1
552 \@makingslidesfalse}}
553 %
554 \else %% if@compatibility
555 %
556 \def\setupcounters{\newpage\setcounter{page}{0}\@bwtrue\@visibletrue
557 \ifonlyslidesw \xdef\@doslidelist{\@doglslidelist}%
558 \@setlimits\@doslidelist\@doslidelow\@doslidehigh\fi
559 \ifonlynotesw \xdef\@donotelist{\@doglnotelist}%
560 \@setlimits\@donotelist\@donotelow\@donotehigh\fi
561 \normalsize\setcounter{slide}{0}\setcounter{overlay}{0}%
562 \setcounter{note}{0}\@makingslidesfalse}
563
564 \AtBeginDocument{\setupcounters}
565 \fi %% if@compatibility

\slide COLORS :=
BEGIN
\changes{v2.3}{1994/03/16}{Moved \cs{newpage} up front, here and in
\cs{note} and \cs{overlay}}
\par\break
\stepcounter{slide}
\setcounter{page}{0} % in case of non-slide pages
\@slidesw :=G T
if @onlyslidesw = true % set \@slidesw = T iff
then % page to be output
while \c@slide > \@doslidehigh
do \@setlimits\@doslidelist\@doslidelow\@doslidehigh od
if \c@slide < \@doslidelow
then \@slidesw := F
fi
fi
if \@slidesw = T
then \@slidesw :=G F

```



```

        \begingroup
        if @bw = true
        then \@slidesw :=G T
        else \@color{COLORS}
        \if@visible then \@slidesw :=G T \fi
        fi
        \endgroup
    fi
    if \@slidesw = T
    then @makingslides := T
    \thispagestyle{slide}
    else \end{slide}
    \gobbletoend{slide}
    fi
END

\endslide ::=
BEGIN
\par\break
END

566 \if@compatibility
567 \def\slide#1{\stepcounter{slide}\G@slideswtrue\if@onlyslidesw
568 \@whilenum \c@slide >\@doslidehigh\relax
569 \do{\@setlimits\@doslidelist\@doslidelow\@doslidehigh}\ifnum
570 \c@slide <\@doslidelow\relax\G@slideswfalse\fi\fi
571 \ifG@slidesw
572 \G@slideswfalse
573 % FMi this is only a hack at the moment to get things running.
574 % \begingroup
575 \if@bw\G@slideswtrue\else
576 \@color{#1}\if@visible \G@slideswtrue \fi
577 \fi
578 % \endgroup
579 \fi
580 \ifG@slidesw \newpage\thispagestyle{slide}%

This will set up the last color specified in the argument to \slide as the current
color. If only back and white slides are prepared \last@color will be empty and
effectively \relax will be generated (hopefully).

We need to reset to a default font at the beginning of a slide. (not done yet).

581 \csname \last@color \endcsname

582 \else\end{slide}\@gobbletoend{slide}\fi}
583 %
584 \else %% if@compatibility
585 %
586 \def\slide{\par\break
587 \stepcounter{slide}\setcounter{page}{0}\G@slideswtrue\if@onlyslidesw
588 \@whilenum \c@slide >\@doslidehigh\relax
589 \do{\@setlimits\@doslidelist\@doslidelow\@doslidehigh}\ifnum
590 \c@slide <\@doslidelow\relax\G@slideswfalse\fi\fi
591 \ifG@slidesw
592 \G@slideswfalse
593 % FMi this is only a hack at the moment to get things running.

```

```

594 % \beginngroup
595 \if@bw\G@slideswtrue\else
596 \if@visible \G@slideswtrue \fi
597 \fi
598 % \endgroup
599 \fi
600 \ifG@slidesw \@makingslidestrue\thispagestyle{slide}%

```

This will set up the last color specified in the argument to `\slide` as the current color. If only back and white slides are prepared `\last@color` will be empty and effectively `\relax` will be generated (hopefully).

We need to reset to a default font at the beginning of a slide. (not done yet).

```

601 \csname \last@color \endcsname
602 \else\end{slide}\@gobbletoend{slide}\fi}
603 \fi %% if@compatibility
604
605 \let\last@color\@empty
606
607 \def\endslide{\par\break}

\overlay COLORS ::=
BEGIN
  \par\break
  \stepcounter{overlay}
  \setcounter{page}{0} % in case of non-slide pages
  \@slidesw :=G T
  if @onlyslidesw = T % set \@slidesw = T iff
  then % page to be output
    if \c@slide < \@doslidelow
    then \@slidesw :=G F
    fi
  fi
  if \@slidesw = T
  \@slidesw :=G F
  \beginngroup
    if @bw = true
    then \@slidesw :=G T
    else \@color{COLORS}
    \if@visible then \@slidesw :=G T \fi
    fi
  \endgroup
  fi
  if \@slidesw = T
  then @makingslides := T
  \thispagestyle{overlay}
  else \end{overlay}
  \@gobbletoend{overlay}
  fi
END

\endoverlay ::=
BEGIN
  \par\break
  END

```

```

608 \if@compatibility
609 \def\overlay#1{\stepcounter{overlay}\G@slideswtrue%
610 \if@onlyslidesw\ifnum \c@slide <\@doslidelow\relax
611 \G@slideswfalse\fi\fi
612 \ifG@slidesw \G@slideswfalse\beginingroup\if@bw\G@slideswtrue%
613 \else\@color{#1}\if@visible \G@slideswtrue\fi\fi\endgroup\fi
614 \ifG@slidesw \newpage\thispagestyle{overlay}%
615 \else\end{overlay}\@gobbletoend{overlay}\fi}
616 %
617 \else %%if@compatibility
618 %
619 \def\overlay{\par\break
620 \stepcounter{overlay}%
621 \setcounter{page}{0}%
622 \G@slideswtrue%
623 \if@onlyslidesw\ifnum \c@slide <\@doslidelow\relax
624 \G@slideswfalse\fi\fi
625 \ifG@slidesw \G@slideswfalse
626 \beginingroup\if@bw\G@slideswtrue%
627 \else\if@visible \G@slideswtrue\fi\fi
628 \endgroup\fi
629 \ifG@slidesw \@makingslides\thispagestyle{overlay}%
630 \else\end{overlay}\@gobbletoend{overlay}\fi}
631 \fi %%if@compatibility
632
633 \def\endoverlay{\par\break}

\note ::=
BEGIN
\par\break
\stepcounter{note}
\setcounter{page}{0} % in case of non-slide pages
if @bw = T
then
\@slidesw :=G T
if @onlynotesw = true % set \@notesw = T iff
then % page to be output
while \c@slide > \@donotehigh
do \setlimits\@donotelist\@donotelow\@donotehigh od
if \c@slide < \@donotelow
then \@slidesw :=G F
fi
fi
else \@slidesw :=G F
fi
if \@slidesw = T
then @makingslides := T
\thispagestyle{note}
else \end{note}
\@gobbletoend{note}
fi
END

\endnote ::=
BEGIN

```

```

\par\break
END

634 \if@compatibility
635 \def\note{\stepcounter{note}%
636   \if@bw
637     \G@slideswtrue
638     \if@onlynotesw\@whilenum \c@slide >\@donotehigh\relax
639     \do{\@setlimits\@donotelist\@donotelow\@donotehigh}\ifnum
640       \c@slide <\@donotelow\relax \G@slideswfalse\fi\fi
641     \else\G@slideswfalse\fi
642     \ifG@slidesw \newpage\thispagestyle{note}\else
643     \end{note}\@gobbletoend{note}\fi}
644 %
645 \else %%if@compatibility
646 %
647 \def\note{\par\break\stepcounter{note}\setcounter{page}{0}%
648   \if@bw
649     \G@slideswtrue
650     \if@onlynotesw\@whilenum \c@slide >\@donotehigh\relax
651     \do{\@setlimits\@donotelist\@donotelow\@donotehigh}\ifnum
652       \c@slide <\@donotelow\relax \G@slideswfalse\fi\fi
653     \else\G@slideswfalse\fi
654     \ifG@slidesw \@makingslidesw\thispagestyle{note}\else
655     \end{note}\@gobbletoend{note}\fi}
656 \fi %%if@compatibility
657
658 \def\endnote{\par\break}

\@color{COLORS} ::=
BEGIN
  if math mode
    then type warning
  fi
  if @bw
    then \visible
    else \invisible
      for \last@color := COLORS
      do if \last@color = \@currcolor
        then \visible
      fi
    od
  fi
  \ignorespaces
END

FMi: \last@color will be used in \slide to set up first color if no color is given. I
suppose that this is much too complicated. \else\@tempwafalse would produce
the same effect I imagine.

659 \def\@color#1{\@mmode test
660   {\if@bw \@tempwattrue \else \@tempwafalse
661     \@for \reserved@a :=#1\do{\ifx\reserved@a\@currcolor\@tempwattrue\fi
662       \let\last@color\reserved@a}\fi
663   \if@tempwa \visible \else \invisible \fi

```

```

664 \ignorespaces}}
665
666 \def\@mmodetest#1{\ifmmode\ClassWarning{slides}{Color-changing command
667     in math mode has been ignored}\else #1\fi}
668
669 \def\invisible{\@mmodetest
670   {\if@visible
671     \@visiblefalse
672     \fontshape\f@shape\selectfont
673     \mathversion{invisible}%
674   \fi
675   \ignorespaces}}
676
677 \def\visible{\@mmodetest
678   {\if@visible
679     \else
680     \@visibletrue
681     \fontshape{\expandafter\@gobble\f@shape}\selectfont
682     \mathversion{normal}%
683   \fi
684   \ignorespaces}}
685
686 \def\fontshape#1{\edef\f@shape{\if@visible \else I\fi #1}}

```

Here is the L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> interface hidden. We use a trick to provide ourselves with a sort of additional attribute without making the current mechanism even larger. The trick is that we denote invisible by putting an uppercase I in front of the shape name for invisible shapes and remove it again if we want to become visible.

### 10.3 Macros for font handling

We let `\familydefault` point at `\sfdefault`, to make it easier to use the document class slides with packages that set up other fonts.

```

687 \renewcommand{\familydefault}{\sfdefault}

```

The `latexsym` package, which is needed to be able to access the L<sup>A</sup>T<sub>E</sub>X symbol fonts (`lasy`), sets things up so that for sizes larger than 10 point magnifications of `lasy10` are used. For slides we want to use magnifications of `lasy8`, so we set up the `lasy` family here to prevent L<sup>A</sup>T<sub>E</sub>X from loading `Ulasy.fd`.

```

688 \DeclareFontFamily{U}{lasy}{}{}
689 \DeclareFontShape{U}{lasy}{m}{n}{%
690     <12><13.82><16.59><19.907><23.89><28.66><34.4><41.28>lasy8
691 }{}
692 \DeclareFontShape{U}{lasy}{m}{In}{%
693     <13.82><16.59><19.907><23.89><28.66><34.4><41.28>ilasy8
694 }{}
695 \message{picture,}

```

#### 10.3.1 Modifications to the picture environment

Below are the new definitions of the picture-drawing macros required for SLiTeX. Only those commands that actually draw something must be changed so that they do not produce any output when the `@visible` switch is false.

```

696 \def\line(#1,#2)#3{\if@visible\@xarg #1\relax \@yarg #2\relax
697 \@linelen #3\unitlength
698 \ifnum\@xarg =\z@ \@vline
699   \else \ifnum\@yarg =\z@ \@hline \else \@sline\fi
700 \fi\fi}
701
702 \def\vector(#1,#2)#3{\if@visible\@xarg #1\relax \@yarg #2\relax
703 \@linelen #3\unitlength
704 \ifnum\@xarg =\z@ \@vvector
705   \else \ifnum\@yarg =\z@ \@hvector \else \@svector\fi
706 \fi\fi}
707
708 \def\dashbox#1(#2,#3){%
709 \leavevmode\if@visible\hb@xt@\z@{\baselineskip \z@
710 \lineskip \z@
711 \@dashdim #2\unitlength
712 \@dashcnt \@dashdim \advance\@dashcnt 200
713 \@dashdim #1\unitlength\divide\@dashcnt \@dashdim
714 \ifodd\@dashcnt\@dashdim\z@
715 \advance\@dashcnt \@one \divide\@dashcnt \tw@
716 \else \divide\@dashdim \tw@ \divide\@dashcnt \tw@
717 \advance\@dashcnt \m@ne
718 \setbox\@dashbox \hbox{\vrule \@height \@halfwidth \@depth \@halfwidth
719 \@width \@dashdim}\put(0,0){\copy\@dashbox}%
720 \put(0,#3){\copy\@dashbox}%
721 \put(#2,0){\hskip-\@dashdim\copy\@dashbox}%
722 \put(#2,#3){\hskip-\@dashdim\box\@dashbox}%
723 \multiply\@dashdim \thr@@
724 \fi
725 \setbox\@dashbox \hbox{\vrule \@height \@halfwidth \@depth \@halfwidth
726 \@width #1\unitlength\hskip #1\unitlength}\@tempcnta\z@
727 \put(0,0){\hskip\@dashdim \@whilenum \@tempcnta <\@dashcnt
728 \do{\copy\@dashbox\advance\@tempcnta \@one }}\@tempcnta\z@
729 \put(0,#3){\hskip\@dashdim \@whilenum \@tempcnta <\@dashcnt
730 \do{\copy\@dashbox\advance\@tempcnta \@one }}%
731 \@dashdim #3\unitlength
732 \@dashcnt=\@dashdim \advance\@dashcnt 200
733 \@dashdim #1\unitlength\divide\@dashcnt \@dashdim
734 \ifodd\@dashcnt \@dashdim=\z@
735 \advance\@dashcnt \@one \divide\@dashcnt \tw@
736 \else
737 \divide\@dashdim \tw@ \divide\@dashcnt \tw@
738 \advance\@dashcnt \m@ne
739 \setbox\@dashbox\hbox{\hskip -\@halfwidth
740 \vrule \@width \@wholewidth
741 \@height \@dashdim}\put(0,0){\copy\@dashbox}%
742 \put(#2,0){\copy\@dashbox}%
743 \put(0,#3){\lower\@dashdim\copy\@dashbox}%
744 \put(#2,#3){\lower\@dashdim\copy\@dashbox}%
745 \multiply\@dashdim \thr@@
746 \fi
747 \setbox\@dashbox\hbox{\vrule \@width \@wholewidth
748 \@height #1\unitlength}\@tempcnta\z@
749 \put(0,0){\hskip -\@halfwidth \vbox{\@whilenum \@tempcnta <\@dashcnt

```

```

750 \do{\vskip #1\unitlength\copy\@dashbox\advance\@tempcnta \@ne }%
751 \vskip\@dashdim}}\@tempcnta\z@
752 \put(#2,0){\hskip -\@halfwidth \vbox{\@whilenum \@tempcnta <\@dashcnt
753 \relax\do{\vskip #1\unitlength\copy\@dashbox\advance\@tempcnta \@ne }%
754 \vskip\@dashdim}}}\fi\@makepicbox(#2,#3)}
755
756 \def\@oval(#1,#2)[#3]{\if@visible\beginpgroup \boxmaxdepth \maxdimen
757 \@ovttrue \@ovbtrue \@ovltrue \@ovrtrue
758 \@tfor\reserved@a :=#3\do
759 {\csname @ov\reserved@a false\endcsname}\@ovxx
760 #1\unitlength \@ovyy #2\unitlength
761 \@tempdimb \ifdim \@ovyy >\@ovxx \@ovxx\else \@ovyy \fi
762 \advance \@tempdimb -2\p@
763 \@getcirc \@tempdimb
764 \@ovro \ht\@tempboxa \@ovri \dp\@tempboxa
765 \@ovdx\@ovxx \advance\@ovdx -\@tempdima \divide\@ovdx \tw@
766 \@ovdy\@ovyy \advance\@ovdy -\@tempdima \divide\@ovdy \tw@
767 \@circlefnt \setbox\@tempboxa
768 \hbox{\if@ovr \@ovvert32\kern -\@tempdima \fi
769 \if@ovl \kern \@ovxx \@ovvert01\kern -\@tempdima \kern -\@ovxx \fi
770 \if@ovt \@ovhorz \kern -\@ovxx \fi
771 \if@ovb \raise \@ovyy \@ovhorz \fi}\advance\@ovdx\@ovro
772 \advance\@ovdy\@ovro \ht\@tempboxa\z@ \dp\@tempboxa\z@
773 \@put{-\@ovdx}{-\@ovdy}{\box\@tempboxa}%
774 \endgroup\fi}
775
776 \def\@circle#1{\if@visible \beginpgroup \boxmaxdepth \maxdimen
777 \@tempdimb #1\unitlength
778 \ifdim \@tempdimb >15.5\p@\relax \@getcirc\@tempdimb
779 \@ovro\ht\@tempboxa
780 \setbox\@tempboxa\hbox{\@circlefnt
781 \advance\@tempcnta\tw@ \char \@tempcnta
782 \advance\@tempcnta\m@ne \char \@tempcnta \kern -2\@tempdima
783 \advance\@tempcnta\tw@
784 \raise \@tempdima \hbox{\char\@tempcnta}\raise \@tempdima
785 \box\@tempboxa}\ht\@tempboxa\z@ \dp\@tempboxa\z@
786 \@put{-\@ovro}{-\@ovro}{\box\@tempboxa}%
787 \else \@circ\@tempdimb{96}\fi\endgroup\fi}
788
789 \def\@dot#1{%
790 \if@visible\@tempdimb #1\unitlength \@circ\@tempdimb{112}\fi}
791 \def\@frameb@x#1{%
792 \@tempdima\fbboxrule
793 \advance\@tempdima\fbboxsep
794 \advance\@tempdima\dp\@tempboxa
795 \leavevmode
796 \hbox{%
797 \lower\@tempdima\hbox{%
798 \vbox{%
799 \if@visible\hrule\@height\else\vskip\fi\fbboxrule
800 \hbox{%
801 \if@visible\vrule\@width\else\hskip\fi\fbboxrule
802 #1%

```

```

803         \vbox{%
804             \vskip\fbboxsep
805             \box\@tempboxa
806             \vskip\fbboxsep}%
807     #1%
808     \if@visible\vrule\@width\else\hskip\fi\fbboxrule}%
809     \if@visible\hrule\@height\else\vskip\fi\fbboxrule}}}}
810
811 \long\def\frame#1{\if@visible\leavevmode
812 \vbox{\vskip-\@halfwidth\hrule \@height\@halfwidth \@depth \@halfwidth
813 \vskip-\@halfwidth\hbox{\hskip-\@halfwidth \vrule \@width\@wholewidth
814 \hskip-\@halfwidth #1\hskip-\@halfwidth \vrule \@width \@wholewidth
815 \hskip -\@halfwidth}\vskip -\@halfwidth\hrule \@height \@halfwidth
816 \@depth \@halfwidth\vskip -\@halfwidth}\else #1\fi}
817 \message{mods,}

```

### 10.3.2 Other modifications to T<sub>E</sub>X and L<sup>A</sup>T<sub>E</sub>X commands

```

\rule
818 \def\@rule[#1]#2#3{\@tempdima#3\advance\@tempdima #1\leavevmode
819 \hbox{\if@visible\vrule
820 \@width#2 \@height\@tempdima \@depth-#1\else
821 \vrule \@width \z@ \@height\@tempdima \@depth-#1\vrule
822 \@width#2 \@height\z@\fi}}
823
824 % \_ (Added 10 Nov 86)
825
826 \def\_{\leavevmode \kern.06em \if@visible\vbox{\hrule \@width.3em}\else
827 \vbox{\hrule \@height \z@ \@width.3em}\vbox{\hrule \@width \z@\fi}}

\overline, \underline, \frac and \sqrt

\@mathbox{STYLE}{BOX}{MTEXT} : Called in math mode, typesets MTEXT and
stores result in BOX, using style STYLE.

\@bphant{BOX} : Creates a phantom with dimensions BOX.
\@vbphant{BOX} : Creates a phantom with ht of BOX and zero width.
\@hbphant{BOX} : Creates a phantom with width of BOX
and zero ht & dp.
\@hvsmash{STYLE}{MTEXT} : Creates a copy of MTEXT with zero height and
width in style STYLE.

828 \def\@mathbox#1#2#3{\setbox#2\hbox{\m@th#1{#3}}}%
829
830 \def\@vbphantom#1{\setbox\tw@ \null \ht\tw@ \ht #1\dp\tw@ \dp #1%
831 \box\tw@}
832
833 \def\@bphantom#1{\setbox\tw@ \null
834 \wd\tw@ \wd #1\ht\tw@ \ht #1\dp\tw@ \dp #1%
835 \box\tw@}
836
837 \def\@hbphantom#1{\setbox\tw@ \null \wd\tw@ \wd #1\ht\tw@ \z@ \dp\tw@ \z@
838 \box\tw@}

```



```

839
840 \def\hvsmash#1#2{\@mathbox#1\z@{#2}\ht\z@\z@ \dp\z@\z@ \wd\z@\z@
841   \box\z@}
842
843 \def\underline#1{\relax\ifmmode
844   \@xunderline{#1}\else $\m@th\@xunderline{\hbox{#1}}$\relax\fi}
845
846 \def\@xunderline#1{\mathchoice{\@xyunderline\displaystyle{#1}}%
847   {\@xyunderline
848     \textstyle{#1}}{\@xyunderline\scriptstyle{#1}}{\@xyunderline
849     \scriptscriptstyle{#1}}}%
850
851 \def\@xyunderline#1#2{%
852   \@mathbox#1\@smashboxa{#2}\@hvsmash#1{\copy\@smashboxa}%
853   \if@visible \@hvsmash#1{\@@underline{\@bphantom\@smashboxa}}\fi
854   \@mathbox#1\@smashboxb{\@@underline{\box\@smashboxa}}%
855   \@bphantom\@smashboxb}
856
857 \let\@overline=\overline
858
859 \def\overline#1{\mathchoice{\@xoverline\displaystyle{#1}}{\@xoverline
860   \textstyle{#1}}{\@xoverline\scriptstyle{#1}}{\@xoverline
861   \scriptscriptstyle{#1}}}%
862
863 \def\@xoverline#1#2{%
864   \@mathbox#1\@smashboxa{#2}\@hvsmash#1{\copy\@smashboxa}%
865   \if@visible \@hvsmash#1{\@@overline{\@bphantom\@smashboxa}}\fi
866   \@mathbox#1\@smashboxb{\@@overline{\box\@smashboxa}}%
867   \@bphantom\@smashboxb}

\@frac {STYLE}{DENOMSTYLE}{NUM}{DEN}{FONTSIZE} :
  Creates \frac{NUM}{DENOM}
  in style STYLE with NUM and DENOM in style DENOMSTYLE
  FONTSIZE should be \textfont \scriptfont or \scriptscriptfont

```

Added a group around the first argument of `\frac` to prevent changes (for example font changes) to modify the contents of the second argument.

```

868 \def\frac#1#2{\mathchoice
869   {\@frac\displaystyle\textstyle{#1}{#2}\textfont}{\@frac
870     \textstyle\scriptstyle{#1}{#2}\textfont}{\@frac
871       \scriptstyle\scriptscriptstyle{#1}{#2}\scriptfont}{\@frac
872         \scriptscriptstyle\scriptscriptstyle{#1}{#2}\scriptscriptfont}}
873
874 \def\@frac#1#2#3#4#5{%
875   \@mathbox#1\@smashboxc{\begingroup#3\endgroup\over#4}}%
876   \setbox\tw@ \null
877   \ht\tw@ \ht\@smashboxc
878   \dp\tw@ \dp\@smashboxc
879   \wd\tw@ \wd\@smashboxc
880   \box\if@visible\@smashboxc\else\tw@\fi}
881
882 \def\r@t#1#2{\setbox\z@\hbox{$\m@th#1\@xysqrt#1{#2}$}%
883   \dimen@ \ht\z@ \advance\dimen@-\dp\z@
884   \mskip5mu\raise.6\dimen@\copy\rootbox \mskip-10mu\box\z@}

```

```

885 \def\sqrt{\@ifnextchar[{\@sqrt}{\@xsqrt}}
886 \def\@sqrt[#1]{\root #1\of}
887 \def\@xsqrt#1{\mathchoice{\@xysqrt\displaystyle{#1}}{\@xysqrt
888   \textstyle{#1}}{\@xysqrt\scriptstyle{#1}}{\@xysqrt
889   \scriptscriptstyle{#1}}}
890 \def\@xysqrt#1#2{\@mathbox#1\@smashboxa{#2}\if@visible
891   \@hvsdash#1{\sqrtsign{\@bphantom\@smashboxa}}\fi
892   \phantom{\sqrtsign{\@vbphantom\@smashboxa}}\box\@smashboxa}
893
894 \newbox\@smashboxa
895 \newbox\@smashboxb
896 \newbox\@smashboxc

```

array and tabular environments: changes to ‘|’, \hline, \cline, and \vline, added 8 Jun 88

```

897 \def\arrayrule{\if@visible\@addtopreamble{\hskip -.5\arrayrulewidth
898   \vrule \@width \arrayrulewidth\hskip -.5\arrayrulewidth}\fi}
899 \def\cline#1{\if@visible\@cline#1\@nil\fi}
900
901 \def\hline{\noalign{\ifnum0='}\fi
902   \if@visible \hrule \@height \arrayrulewidth
903   \else \hrule \@width \z@
904   \fi
905   \futurelet \reserved@a\@xhline}
906
907 \def\vline{\if@visible \vrule \@width \arrayrulewidth
908   \else \vrule \@width \arrayrulewidth \@height \z@
909   \@depth \z@ \fi}
910 \message{output,}

```

### 10.3.3 Changes to L<sup>A</sup>T<sub>E</sub>X output routine

```

\@makecol ==
BEGIN
% Following test added for slides to check if extra page
if @makingslides = T
then if \c@page > 0
then if \c@note > 0
then type 'Note \thenote too long.'
else if \c@overlay > 0
then type 'Overlay \theoverlay too long.'
else type 'Slide \theslide too long'
fi fi fi fi
ifvoid \insert\footins
then \@outputbox := \box255
else \@outputbox := \vbox {\unvbox255
\vskip \skip\footins
\footnoterule
\unvbox\@footinsert
}
fi
\@freelist :=G \@freelist * \@midlist
\@midlist :=G empty

```

```

\@combinefloats
\@outputbox := \vbox to \@colht{\boxmaxdepth := \maxdepth
\vfil      %%\vfil added for slides
\unvbox\@outputbox
\vfil }    %%\vfil added for slides

\maxdepth :=G \@maxdepth
END

```

FMi simple hack to allow none centered slides Should be revised of course.

```

911 \let\@topfil\vfil
912
913 \def\@makecol{\if@makingslides\ifnum\c@page>\z@ \@extraslide\fi\fi
914 \ifvoid\footins \setbox\@outputbox\box\@cclv \let\@botfil\vfil
915 \else\let\@botfil\relax\setbox\@outputbox
916 \vbox{\unvbox\@cclv\vfil
917 \vskip\skip\footins\footnoterule\unvbox\footins\vskip
918 \z@ plus.1fil\relax}\fi
919 \xdef\@freelist{\@freelist\@midlist}\gdef\@midlist{}\@combinefloats
920 \setbox\@outputbox\vbox to\@colht{\boxmaxdepth\maxdepth
921 \@topfil\unvbox\@outputbox\@botfil}\global\maxdepth\@maxdepth}
922
923 \def\@extraslide{\ifnum\c@note>\z@
924 \ClassWarning{slides}{Note \thenote\space too long}\else
925 \ifnum\c@overlay>\z@
926 \ClassWarning{slides}{Overlay \theoverlay\space too long}\else
927 \ClassWarning{slides}{Slide \theslide\space too long}\fi\fi}
928 \message{init}

```

### 10.3.4 Special L<sup>A</sup>T<sub>E</sub>X initializations

FMi why not allow for ref's ?

```

929 % \nofiles
930
931 \@visibletrue
932 \</cmd>

```