

# The `latex-lab-testphase-new-or-2` code\*

Frank Mittelbach, L<sup>A</sup>T<sub>E</sub>X Project

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## Abstract

This code implements changes to the output routine intended to be moved in the L<sup>A</sup>T<sub>E</sub>X kernel at some point in the future.

## 1 Introduction

## 2 Hooks and replaceable code blocks

### 2.0.1 Replaceable code blocks (sockets)

To cater for different layouts with respect to text, footnotes, and bottom-floats placements there are two sockets for now.

**@makecol/outputbox (0 arguments)** In code for this socket the `\@outputbox` (holding the galley text for the current column or page) is augmented by attaching floats and footnote areas together with appropriate spacing.

Prior to calling the socket the output routine has already decided which floats go into which area and which get deferred. Therefore, the assumption is that the code in the socket attaches all areas that contain floats. If this is not done, then the order of floats is likely to be screwed up unless unused floats are moved to the defer list in an appropriate way (for now we don't offer any interface for that scenario).

Before the code in the socket is run, any existing glue at the bottom of the `\@outputbox` is removed and stored in a safe place. If needed, it can be reinserted with one of the helper commands.

To support setting this up the following helper commands are available:

**\@outputbox@append (1 argument)**

This general purpose command alters the `\@outputbox` box by appending material to it.

**\@outputbox@appendfootnotes (0 arguments)**

This command appends the footnotes to the `\@outputbox` (if there are any). If not, then it does nothing.

**\@outputbox@attachfloats (0 arguments)**

**\@outputbox@attachtopfloats (0 arguments)**

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\*

**\@outputbox@attachbottomfloats (0 arguments)**

Attaching top and bottom floats can usually be done in one go, but for special layouts we might want more control so we provide also separate commands.

**\@outputbox@reinsertbskip (0 arguments)**

Reinsert the bottom skip of the \@outputbox that was saved before.

**Testing for existence of material**

There are a number of helpers to run conditional code depending on whether or not there are footnotes or bottom floats. They are \@if@footnotes@TF and \@if@bfloats@TF (names are likely to change).

*TODO: Decide on names for these helper commands. We could keep them similar to the above (because they are only supposed to be used by a few packages). However, we could alternatively use CamelCase names, under the assumption that classes may also directly define a plug for the socket, instead of loading a support package such as `footmisc` (or in addition to).  
— decide*

This socket cannot be empty but needs appropriate code; a set of suitable plugs for it are already given in the kernel. These are

**space-footnotes-floats** After the galley text there is a vertical \vfill followed by any footnotes followed by the bottom floats, if any.

**floats-footnotes-space** As before but the \vfill is at the bottom (page is ragged bottom).

**footnotes-space-floats** As before but the \vfill is between footnotes and floats.

**space-floats-footnotes** Here the footnotes come last.<sup>1</sup>

**floats-footnotes** All excess space has to be distributed across the existing glue on the page, e.g., within the text galley, the separation between blocks, etc. The order is text, floats, footnotes.

**footnotes-floats** As the previous one but floats and footnotes are swapped. This is the L<sup>A</sup>T<sub>E</sub>X default, i.e., this plug is assigned to the socket.

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**@makecol/footnotes (0 arguments)** This socket is used to manipulate the footnote material inside \box\footins. It if contains code, it is supposed to do some processing of that box and then write the result back into it (and nothing else!). By default it does nothing, i.e., has the `noop` assigned.

If (short) footnotes are run as a paragraph this socket gets the plug `para` assigned which is defined elsewhere.

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<sup>1</sup>There are two more permutations, but neither of them has ever been requested so they aren't set up by default — doing that in a class would be trivial though.

## 3 The Implementation

1 `<*package>`

### 3.1 File declaration

```
2 \ProvidesPackage{latex-lab-testphase-new-or-2}
3     [\lftlabneworIIdate\space v\lftlabneworIIversion\space
4     Changes to the output routine]
```

### 3.2 `\@makecol` reimplementation

In order for other packages to prepend or append code to `\@makecol` the generic command hooks `cmd/\@makecol/before` and `cmd/\@makecol/after` can be used, so for now there is nothing we need to do for this.

`\@makecol` `\@makecol` is shortened a lot, basically all the hardwired code in the middle has moved into a socket.

```
5 \def \@makecol {%
```

Save away box 255 as `\@outputbox` to make it available for further adjustments.

```
6 \setbox\@outputbox \box\@cclv
```

The only real addition is the next command which either does nothing or removes an infinite glue from the bottom of the `\@outputbox`.

```
7 \outputbox@removebskip
```

Now a kernel hook for tagging.

*TODO: The name is likely to change and it probably will eventually be replaced with a socket.*

```
8 \@kernel@taggsupport@\@makecol
```

When this code is run any “here” floats in the `\@outputbox` are already handled, so we recycle their registers and put them back to the `\@freelist`.

```
9 \let\@elt\relax
10 \xdef\@freelist{\@freelist\@midlist}%
11 \global \let \@midlist \@empty
```

Here we have the configurable part. This socket is supposed to add floats, footnotes and stretchable vertical space as appropriate to the `\@outputbox`.

```
12 \UseSocket{\@makecol/outputbox}%
```

Then we deal with any `\enlargethispage` or run the normal code to build a column.

```
13 \ifvbox\@kludgeins
14     \@make@specialcolbox
15 \else
16     \@make@normalcolbox
17 \fi
18 \global \maxdepth \@maxdepth
19 }
```

*(End of definition for \@makecol. This function is documented on page ??.)*

`\@outputbox@depth` We need to know the depth of `\@outputbox` once in a while. Rather than using a temp dimen (as it was done in the past), we give it a proper register.

```
20 \newdimen\@outputbox@depth
```

(End of definition for `\@outputbox@depth`. This function is documented on page ??.)

`\@make@normalcolbox` Taken out of `\@makecol` for readability.

```

21 \def \@make@normalcolbox {%
22   \setbox\@outputbox \vbox to\@colht {%
23     \texttop
24     \@outputbox@depth \dp\@outputbox
25     \unvbox \@outputbox
26     \vskip -\@outputbox@depth
27     \textbottom
28   }%
29 }
```

(End of definition for `\@make@normalcolbox`. This function is documented on page ??.)

`\@make@specialcolbox` Make the colbox when `\enlargethispage` was used.

```

30 \def \@make@specialcolbox {%
31   \@outputbox@append {\vskip-\@outputbox@depth}%
32   \@tempdima \@colht
33   \ifdim \wd\@kludgeins>\z@
34     \advance \@tempdima -\ht\@outputbox
35     \advance \@tempdima \pageshrink
36     \setbox\@outputbox \vbox to \@colht {%
37       \unvbox\@outputbox
38       \vskip \@tempdima
39       \textbottom
40     }%
41   \else
42     \advance \@tempdima -\ht\@kludgeins
43     \setbox \@outputbox \vbox to \@colht {%
44       \vbox to \@tempdima {%
45         \unvbox\@outputbox
46         \textbottom}%
47     \vss}%
48   \fi
49   {\setbox \@tempboxa \box \@kludgeins}%
50 }
```

(End of definition for `\@make@specialcolbox`. This function is documented on page ??.)

`\@outputbox@removebskip` This is really a bug fix for the kernel but one we only automatically make in new documents that are using `\DocumentMetadata`.

TODO: *may make optional for legacy docs*

If `\raggedbottom` is in force, footnotes get attached to the main galley at a distance of `\footskip` on all pages except on those that are ended by `\newpage` or `\clearpage` where the `\vfil` from `\newpage` pushes the footnotes to the very bottom.

This is kind of a weird difference to a page ending with `\pagebreak`—in that case the page is also run short, but the footnotes are not pushed to the bottom.

In `footmisc` `\@outputbox@removebskip` is only applied when `footmisc` is called with an option specifying the footnote placement, i.e., not in the default case. In new documents we apply it always.

```

51 \def\@outputbox@removebskip{%
```

We first test if we are in a `\raggedbottom` layout. If not we do nothing, but we don't disable the code because `\raggedbottom` may get used only for some parts of the document.

```
52 \ifx\@textbottom\relax \else
```

We then append some negative glue at the end of `\@outputbox` provided it has a glue stretch order of 1 or more (i.e., contains a `fil` or `fill` part).

```
53 \outputbox@append{%
54 \tempkipa\lastskip
55 \ifnum \gluestretchorder\@tempkipa>\z@
56 \vskip-\@tempkipa
```

We also record the value so that it can be reinserted elsewhere. As we have to do this globally, we also need to explicitly reset it if we don't find any such glue.

```
\@outputbox@reinsertbskip
```

```
57 \xdef\@outputbox@reinsertbskip
58 {\noexpand\@outputbox@append{\vskip\the\@tempkipa}}%
59 \else
60 \global\let\@outputbox@reinsertbskip\relax
61 \fi
62 }%
63 \fi
64 }
```

We need a trivial top-level definition for `\@outputbox@reinsertbskip` in case the first page has no bottom glue and the command gets called.

```
65 \let\@outputbox@reinsertbskip\relax
```

*(End of definition for \@outputbox@removebskip and \@outputbox@reinsertbskip. These functions are documented on page ??.)*

```
\@kernel@before@cclv
\@kernel@before@footins
```

These two commands are internal kernel hooks intended for tagging support in case that is active. They should not be altered by package code! By default they do nothing (and may have been defined already by `\DocumentMetadata`).

*TODO: The names might change and perhaps each of them is turned into a socket named something like `tagsupport/before/cclv` or similar.*

```
66 \providecommand\@kernel@before@cclv{}
67 \providecommand\@kernel@before@footins{}
```

*(End of definition for \@kernel@before@cclv and \@kernel@before@footins. These functions are documented on page ??.)*

### 3.3 The output routine configuration components

Here we provide the components that are used to define code for the `@makecol/outputbox` socket.

```
\@outputbox@append
```

This general purpose command alters the `\@outputbox` box by appending material to it. As this is a box typesetting operation we make sure that the last line of the box reflects the true depth of the last line (in case that is needed later). We also expose the current depth of `\@outputbox` as `\@outputbox@depth` before unboxing so that its value can be used by `#1` if wanted.

```
68 \def\@outputbox@append #1{%
69 % \if!\detokenize{#1}!\else
```

```

70     \setbox\@outputbox \vbox {%
71         \boxmaxdepth \@maxdepth
72         \@outputbox@depth\dp\@outputbox      % if needed in #1
73         \unvbox \@outputbox
74         #1%
75     }%
76 % \fi
77 }

```

(End of definition for \@outputbox@append. This function is documented on page ??.)

**\@outputbox@appendfootnotes** This command appends the footnotes to the \@outputbox (if there are any). If not, then it does nothing.

```

78 \def\@outputbox@appendfootnotes {%
79     \ifvoid\footins \else

```

First come two configuration points: what to do if we are in a split footnote situation and a second one that does some manipulation of the \footins box before it gets appended.

*TODO: The code for handling split footnotes will get revised as part of socket handling in the future*

```

80     \@makecol@handlesplitfootnotes
81     \UseSocket{\@makecol/footnotes}%

```

Then the footnotes are appended:

```

82     \@outputbox@append{%
83         \vskip \skip\footins

```

This is a kernel hook for tagging.

*TODO: The name is likely to change and it probably will eventually be replaced with a socket.*

```

84     \@kernel@before@footins
85     \color@begingroup
86     \normalcolor
87     \footnoterule

```

Support for pdfcolfoot, eventually this can go once color is properly supported. The csname is constructed in case it doesn't exist.

```

88     \csname pdfcolfoot@current\endcsname
89     \unvbox \footins
90     \color@endgroup
91 }%
92 \fi
93 }

```

(End of definition for \@outputbox@appendfootnotes. This function is documented on page ??.)

**\@outputbox@attachfloats** Attaching top and bottom floats can usually be done in one go, but for special layouts we might want more control so we provide also separate commands.

```

\@outputbox@attachbottomfloats
94 \let \@outputbox@attachfloats \@combinefloats

```

```

95 \def \@outputbox@attachtopfloats {%
96   \ifx \@toplist\@empty \else \@cflt \fi
97 }
98 \def \@outputbox@attachbottomfloats {%
99   \ifx \@botlist\@empty \else \@cflb \fi
100 }

```

(End of definition for \@outputbox@attachfloats, \@outputbox@attachtopfloats, and \@outputbox@attachbottomfloats. These functions are documented on page ??.)

\@makecol@handlesplitfootnotes  
\@makecol@splitfootnotemessagehook

This is only an early draft and doesn't do much. Contains incomplete preparation for tagging commented out.

TODO: *Interfaces and code will change in the future*

```

101 \def \@makecol@handlesplitfootnotes {%
102 %   \ifx\splitfootnote@continuation\@empty \else
103 %     \setbox\footins\vbox{\splitfootnote@continuation\unvbox\footins}%
104 %     \global\let\splitfootnote@continuation\@empty
105 %   \fi
106   \ifnum\insertpenalties>\z@
107     \@makecol@splitfootnotemessagehook
108 %   \setbox\footins\vbox{\unvbox\footins --- END at split}%
109 %   \gdef\splitfootnote@continuation {--- START after split}%
110   \fi
111 }
112 %\def\splitfootnote@continuation{}

```

This could issue warning if split footnotes are encountered.

```

113 \let \@makecol@splitfootnotemessagehook \@empty

```

(End of definition for \@makecol@handlesplitfootnotes and \@makecol@splitfootnotemessagehook. These functions are documented on page ??.)

@makecol/footnote (socket) The socket allowing the manipulation of \footins box (result needs to be moved back in there). Used when footnotes are reformatted into a single paragraph by the para option of footmisc. By default it does nothing.

```

114 \NewSocket{@makecol/footnotes}{0}

```

TODO: *Some temp interfaces until configuration points are available.*

\@if@flushbottom@TF Test for \flushbottom (currently not used).

```

115 \def \@if@flushbottom@TF{%
116   \ifx\@textbottom\relax
117     \expandafter\@firstoftwo
118   \else
119     \expandafter\@secondoftwo
120   \fi
121 }

```

(End of definition for \@if@flushbottom@TF. This function is documented on page ??.)

`\@if@footnotes@TF` Test if footnotes are present on the current page.

```

122 \def\@if@footnotes@TF{%
123   \ifvoid\footins
124     \expandafter\@secondoftwo
125   \else
126     \expandafter\@firstoftwo
127   \fi
128 }
```

*(End of definition for \@if@footnotes@TF. This function is documented on page ??.)*

`\@if@bfloats@TF` Test if bottom floats are around.

```

129 \def\@if@bfloats@TF{%
130   \ifx \@botlist\@empty
131     \expandafter\@secondoftwo
132   \else
133     \expandafter\@firstoftwo
134   \fi
135 }
```

*(End of definition for \@if@bfloats@TF. This function is documented on page ??.)*

### 3.4 The \@makecol configuration

`@makecol/outputbox (socket)` We have one socket that is supposed to augment the `\@outputbox` by attaching floats and footnotes with appropriate spacing.

```

136 \NewSocket{@makecol/outputbox}{0}
```

The following plugs are available for this socket:

`space-footnotes-floats (plug)` After the galley text there is a vertical `\vfill` followed by any footnotes followed by the bottom floats, if any.

```

137 \NewSocketPlug {@makecol/outputbox}{space-footnotes-floats} {%
138   \@if@footnotes@TF
139     {\@outputbox@append{\vfill}}%
140   {\@if@bfloats@TF
141     {\@outputbox@append{\vfill}}%
142     {\@outputbox@reinsertbskip}%
143   }%
144   \@outputbox@appendfootnotes
145   \@outputbox@attachfloats
146 }
```

`floats-footnotes-space (plug)` As before but the `\vfill` is at the bottom (page is ragged bottom).

```

147 \NewSocketPlug {@makecol/outputbox}{floats-footnotes-space} {%
148   \@outputbox@attachfloats
149   \@if@footnotes@TF
150     {\@outputbox@append{\vfill}}%
151     {\@outputbox@reinsertbskip}%
152   \@outputbox@appendfootnotes
153 }
```



`footnotes-space-floats` (*plug*) As before but the `\vfill` is between footnotes and floats.

```

154 \NewSocketPlug {@makecol/outputbox}{footnotes-space-floats} {%
155   \@outputbox@appendfootnotes
156   \@ifbfloats@TF
157     {\@outputbox@append{\vfill}}%
158     {\@outputbox@reinsertbskip}%
159   \@outputbox@attachfloats
160 }
```

`space-floats-footnotes` (*plug*) Here the footnotes come last.<sup>2</sup>

```

161 \NewSocketPlug {@makecol/outputbox}{space-floats-footnotes} {%
162   \@iffootnotes@TF
163     {\@outputbox@append{\vfill}}%
164     {\@ifbfloats@TF
165       {\@outputbox@append{\vfill}}%
166       {\@outputbox@reinsertbskip}}%
167   \@outputbox@attachfloats
168   \@outputbox@appendfootnotes
169 }
```

`floats-footnotes` (*plug*) All excess space has to be distributed across the existing glue on the page, e.g., within the text galley, the separation between blocks, etc. The order is text, floats, footnotes.

```

170 \NewSocketPlug {@makecol/outputbox}{floats-footnotes} {%
171   \@outputbox@attachfloats
172   \@outputbox@appendfootnotes
```

We do reinsert the bottom skip from `\newpage` if it was taken out earlier. This is, strictly speaking, not necessary in most cases, but it is a `\vfil` while `\raggedbottom` is only generating `\vspace{0pt plus 0.001fil}`, so if you have several `\vfil` on the page before the `\newpage` you would alter the space distribution if one is taken out.

```

173   \@outputbox@reinsertbskip
174 }
```

`footnotes-floats` (*plug*)

```

175 \NewSocketPlug {@makecol/outputbox}{footnotes-floats} {%
176   \@outputbox@appendfootnotes
177   \@outputbox@attachfloats
178   \@outputbox@reinsertbskip
179 }
```

The `footnote-floats` plug is the default used by  $\text{\LaTeX}$ ; it can be overwritten either through `footmisc` or by assigning any of the other plugs (or by coding yet another plug for the socket).

```

180 \AssignSocketPlug {@makecol/outputbox}{footnotes-floats}
```

## 4 Replacement for the `footmisc` package

The replacement for `footmisc`. If the new code is used, we must replace the package if it is loaded by the user:

```

181 \declare@file@substitution{footmisc.sty}{latex-lab-footmisc.ltx}
```

---

<sup>2</sup>There are two more permutations, but neither of them has ever been requested so they aren't set up by default — doing that in a class would be trivial though.

## 5 Temp stuff that is related but should go to the kernel

This is the code from `latex-lab-footnotes.dtx`.

```
182 \input{latex-lab-footnotes.ltx}
183 \</package>
```

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