

The `stfloats` package

Sigitas Tolušis
`sigitas@vtex.lt`

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1 Introduction

The package improves `dblfloat(s)` and footnotes placements mechanism and `baselineskip` glue settings.

With newer `LATEX` release from 2015/01/01 using this package two improvements are available out of the box:

1. Float output keeps order for the same type of floats even with top or bottom `dblfloat` items.
2. `Dblfloats` will appear on the same page where they are defined if they are defined on left column and enough free place is available on the current column/page.

2 Usage

To place `dblfloat(s)` on top or bottom of the page just use optional `[t]` or `[b]`.
Example (to place figure at the page bottom):

```
\begin{figure*}[b]  
...  
\end{figure*}
```

<code>\fnbelowfloat</code>	Puts footnotes below the bottom floats
<code>\fnunderfloat</code>	(default and standard) Puts footnotes under the bottom floats.
<code>\setbaselinefloat</code>	Allows <code>\baselineskip</code> to stretch and shrink if the <code>\baselineskip</code> is set internally with command <code>\@setfontsize</code> (<code>\linespread</code> and <code>\fontsize</code> at user level). The settings are calculated and activated with command <code>\selectfont</code> (<code>\size@update</code>).

Example:

```
\@setfontsize\normalsize\@xpt{12pt plus .1pt minus .1pt}\normalsize
```

`\setbaselinefixed` (default and standard) Disables `\baselineskip` to stretch and shrink even if the `\baselineskip` is set with command `\setfontsize` as in the previous example in case that `\baselinestretch` is not empty.

Then line spreading is not used `\baselineskip` glue can be controlled by ordinary `\baselinestretch` definition:

- `\def\baselinestretch{1}` - removes `\baselineskip` glue.
- `\def\baselinestretch{}` - keeps `\baselineskip` glue.

3 Implementation

`\@dblbotlist` Used for `dblfloat(s)` to be placed at the page bottom.

```
1 \gdef\@dblbotlist{}
```

Additional counters for `dblfloat(s)` support at the page bottom.

```
2 \newcount\@dblbotnum
3 \newcount\c@dblbotnumber
4 \setcounter{dblbotnumber}{2}
```

`\@dbflt` With extended set of default args: `[tp]` -> `[tbp]`

```
5 \def\@dbflt#1{\ifnextchar[{\xdblfloat{#1}}{\xdblfloat{#1}[tbp]}}
```

`\@dblfloatplacement` With adds to support `dblfloat(s)` placement at the page bottom. From L^AT_EX release 2015/01/01 `\f@depth` is used in `\@testwrongwidth` to look for either column or `dblcolumn` floats. A value of 1sp signals the latter.

```
6 \def \@dblfloatplacement {%
7   \global \@dbltopnum \c@dbltopnumber
8   \global \@dblbotnum \c@dblbotnumber
9   \global \@dbltoproom \dbltopfraction\@colht
10  \@textmin \@colht
11  \advance \@textmin -\@dbltoproom
12  \@fpmin \dblfloatpagefraction\textheight
13  \@fptop \@dblfpsep
14  \@fpsep \@dblfpsep
15  \@fpbot \@dblfpbot
16  \def\f@depth{1sp}%
17 }
```

`\if@before@latex@release` This conditional code is used to check the L^AT_EX release age.

```
18 \newif\if@before@latex@release
19 \def\tmp@reserved@a#1/#2/#3\@nil{%
20   \ifnum#1<2015\relax
21     \@before@latex@releasetrue
22   \else
23     \@before@latex@releasefalse
24   \fi
25 }
26 \expandafter\tmp@reserved@a\fmtversion\@nil
```

L^AT_EX release version before 2015/01/01 support goes here.

`\@addtodblcol` With adds to support dblfloat(s) placement at the page bottom.

```
27 \if@before@latex@release
28 %%% < 2015 start
29 \def\@addtodblcol{%
30   \begingroup
31   \insertfalse
32   \@setfloattypescounts
33   \@getfpsbit \tw@
34   \ifodd\@tempcnta
35     \flsetnum \@dbltopnum
36     \ifnum \@dbltopnum>\z@
37       \tempswafalse
38       \ifdim \@dbltoproom>\ht\@currbox
39         \tempwatrue
40       \else
41         \ifnum \@fpstype<\sixt@n
42           \advance \@dbltoproom \@textmin
43           \ifdim \@dbltoproom>\ht\@currbox
44             \tempwatrue
45           \fi
46           \advance \@dbltoproom -\@textmin
47         \fi
48       \fi
49     \if@tempswa
50       \bitor \@currtype \@dbldeferlist
51       \if@test
52       \else
53         \bitor \@currtype \@dblbotlist
54         \if@test
55         \else
56           \@tempdima -\ht\@currbox
57           \advance\@tempdima
58           -\ifx \@dbltoplist\@empty \dbltextfloatsep \else
59             \dblfloatsep \fi
60           \global \advance \@dbltoproom \@tempdima
61           \global \advance \@colht \@tempdima
62           \global \advance \@dbltopnum \m@ne
63           \@cons \@dbltoplist \@currbox
64           \@inserttrue
65         \fi
66       \fi
67     \fi
68   \fi
69 \if@insert
70 \else
71 \else
72   \@getfpsbit 4\relax
73   \ifodd\@tempcnta
```

```

74     \@flsetnum \@dblbotnum
75     \ifnum \@dblbotnum>\z@
76         \@tempswafalse
77         \ifdim \@dbltoproom>\ht\@currbox
78             \@tempwatrue
79         \else
80             \ifnum \@fpstype<\sist@@n
81                 \advance \@dbltoproom \@textmin
82                 \ifdim \@dbltoproom>\ht\@currbox
83                     \@tempwatrue
84                 \fi
85                 \advance \@dbltoproom -\@textmin
86             \fi
87         \fi
88     \if@tempswa
89         \@bitor \@currtype \@dbldeferlist
90         \if@test
91         \else
92             \@tempdima -\ht\@currbox
93             \advance\@tempdima
94             -\ifx \@dblbotlist\@empty \dbltextfloatsep \else
95                                     \dblfloatsep \fi
96             \global \advance \@dbltoproom \@tempdima
97             \global \advance \@colht \@tempdima
98             \global \advance \@dblbotnum \m@ne
99             \@cons \@dblbotlist \@currbox
100            \@inserttrue
101        \fi
102    \fi
103    \fi
104    \fi
105    \if@insert
106    \else
107        \@cons\@dbldeferlist\@currbox
108    \fi
109    \fi
110 \endgroup
111 }

```

`\@docclearpage` With adds to support dblfoat(s) placement at the page bottom.

```

112 \def \@docclearpage {%
113     \ifvoid\footins
114         \ifvbox\@kludgeins
115             {\setbox \@tempboxa \box \@kludgeins}%
116         \fi
117         \setbox\@tempboxa\vsplit\@cclv to\z@ \unvbox\@tempboxa
118         \setbox\@tempboxa\box\@cclv
119         \xdef\@deferlist{\@toplist\@botlist\@deferlist}%
120         \global \let \@toplist \@empty
121         \global \let \@botlist \@empty

```

```

122     \global \@colroom \@colht
123     \ifx \@currlist\@empty
124     \else
125         \@latexerr{Float(s) lost}\@ehb
126         \global \let \@currlist \@empty
127     \fi
128     \@makefcolumn\@deferlist
129     \@whilesw\if@fcolmade \fi{\@opcol\@makefcolumn\@deferlist}%
130     \if@twocolumn
131         \if@firstcolumn
132             \xdef\@dbldeferlist{\@dbltoplist\@dblbotlist\@dbldeferlist}%
133             \global \let \@dbltoplist \@empty
134             \global \let \@dblbotlist \@empty
135             \global \@colht \textheight
136             \begingroup
137                 \@dblfloatplacement
138                 \@makefcolumn\@dbldeferlist
139                 \@whilesw\if@fcolmade \fi{\@outputpage
140                                     \@makefcolumn\@dbldeferlist}%
141             \endgroup
142         \else
143             \vbox{}\clearpage
144         \fi
145     \fi
146 \else
147     \setbox\@cclv\vbox{\box\@cclv\vfll}%
148     \@makecol\@opcol
149     \clearpage
150 \fi
151 }
152 %%% < 2015 end
153 \else

```

 Newer L^AT_EX release version from 2015/01/01 support goes here.

```

154 %%% > 2015 start

```

\@addtodblcol With adds to support dblfloat(s) placement on the current page and at the page bottom.

```

155 \def\@addtodblcol{%
156     \begingroup
157     \@insertfalse
158     \@setfloattypescounts
159     \@getfpsbit \tw@
160     \ifodd\@tempcnta
161         \@flsetnum \@dbltopnum
162         \ifnum \@dbltopnum>\z@
163             \@tempswafalse
164             \ifdim \@dbltoproom>\ht\@currbox
165                 \@tempswatrue

```

```

166     \else
167         \ifnum \@fpstype<\sixt@@n
168             \advance \@dbltoproom \@textmin
169             \ifdim \@dbltoproom>\ht\@currbox
170                 \@tempwatruw
171             \fi
172             \advance \@dbltoproom -\@textmin
173         \fi
174     \fi
175     \if@tempswa
176         \@bitor \@currtype \@deferlist
177         \@testwrongwidth\@currbox
178         \if@test
179             \else
180                 \@bitor \@currtype \@dblbotlist
181                 \if@test
182                     \else
183                         \@tempdima -\ht\@currbox
184                         \advance\@tempdima
185                         -\ifx \@dbltoplist\@empty \dbltextfloatsep \else
186                             \dblfloatsep \fi
187                         \global \advance \@dbltoproom \@tempdima
188                         \global \advance \@colht \@tempdima
189                         \global \advance \@dbltopnum \m@ne
190                         \@cons \@dbltoplist \@currbox
191                         \@inserttrue
192                 \fi
193             \fi
194         \fi
195     \fi
196 \fi
197 \if@insert
198 \else
199     \@getfpsbit 4\relax
200     \ifodd\@tempcnta
201         \@flsetnum \@dblbotnum
202         \ifnum \@dblbotnum>\z@
203             \@tempwafalse
204             \ifdim \@dbltoproom>\ht\@currbox
205                 \@tempwatruw
206             \else
207                 \ifnum \@fpstype<\sixt@@n
208                     \advance \@dbltoproom \@textmin
209                     \ifdim \@dbltoproom>\ht\@currbox
210                         \@tempwatruw
211                     \fi
212                     \advance \@dbltoproom -\@textmin
213                 \fi
214             \fi
215         \if@tempswa

```

```

216         \@bitor \@currtype \@deferlist
217         \@testwrongwidth\@currbox
218         \if@test
219         \else
220         \@tempdima -\ht\@currbox
221         \advance\@tempdima
222         -\ifx \@dblbotlist\@empty \dbltextfloatsep \else
223             \dblfloatsep \fi
224         \global \advance \@dbltoproom \@tempdima
225         \global \advance \@colht \@tempdima
226         \global \advance \@dblbotnum \m@ne
227         \@cons \@dblbotlist \@currbox
228         \@inserttrue
229     \fi
230 \fi
231 \fi
232 \fi
233 \if@insert
234 \else
235     \@cons\@deferlist\@currbox
236 \fi
237 \fi
238 \endgroup
239 }

```

\@addtocurcol With adds to support dblfloat(s) placement on the current page and at the page bottom.

```

240 \def \@addtocurcol {%
241     \@insertfalse
242     \@setfloattypescounts
243     \ifnum \@fpstype=8
244     \else
245         \ifnum \@fpstype=24
246         \else
247             \@flsettextmin
248             \advance \@textmin \@textfloatsheight
249             \@reqcolroom \@pageht
250             \ifdim \@textmin>\@reqcolroom
251                 \@reqcolroom \@textmin
252             \fi
253             \advance \@reqcolroom \ht\@currbox
254             \ifdim \@colroom>\@reqcolroom
255                 \@flsetnum \@colnum
256                 \ifnum \@colnum>\z@
257                     \@bitor\@currtype\@deferlist
258                     \@testwrongwidth\@currbox
259                 \if@test
260                     \if@firstcolumn
261                         \@getfpsbit \tw@
262                     \ifodd\@tempcnta

```

```

263 \@flsetnum \@dbltopnum
264 \ifnum \@dbltopnum>\z@
265 \@tempswafalse
266 \ifdim \@dbltoproom>\ht\@currbox
267 \@tempwatrue
268 \else
269 \ifnum \@fpstype<\sist@n
270 \advance \@dbltoproom \@textmin
271 \ifdim \@dbltoproom>\ht\@currbox
272 \@tempwatrue
273 \fi
274 \advance \@dbltoproom -\@textmin
275 \fi
276 \fi
277 \if@tempswa
278 \@bitor\@currtype{\@toplist\@midlist\@botlist\@dblbotlist}%
279 \if@test
280 \else
281 \@tempdima -\ht\@currbox
282 \advance\@tempdima
283 -\ifx \@dbltoplist\@empty \dbltextfloatsep \else
284 \dblfloatsep \fi
285 \global \advance \@dbltoproom \@tempdima
286 \global \advance \@colht \@tempdima
287 \global \advance \@colroom \@tempdima
288 \global \advance \@dbltopnum \m@ne
289 \@cons \@dbltoplist \@currbox
290 \inserttrue
291 \fi
292 \fi
293 \fi
294 \else
295 \@getfpsbit 4\relax
296 \ifodd\@tempcnta
297 \@flsetnum \@dblbotnum
298 \ifnum \@dblbotnum>\z@
299 \@tempswafalse
300 \ifdim \@dbltoproom>\ht\@currbox
301 \@tempwatrue
302 \else
303 \ifnum \@fpstype<\sist@n
304 \advance \@dbltoproom \@textmin
305 \ifdim \@dbltoproom>\ht\@currbox
306 \@tempwatrue
307 \fi
308 \advance \@dbltoproom -\@textmin
309 \fi
310 \fi
311 \if@tempswa
312 \@tempdima -\ht\@currbox

```



```

313         \advance\@tempdima
314         -\ifx \@dblbotlist\@empty \dbltextfloatsep \else
315             \dblfloatsep \fi
316         \global \advance \@dbltoproom \@tempdima
317         \global \advance \@colht \@tempdima
318         \global \advance \@colroom \@tempdima
319         \global \advance \@dblbotnum \m@ne
320         \@cons \@dblbotlist \@currbox
321         \inserttrue
322     \fi
323     \fi
324     \fi
325     \fi
326     \fi
327 \else
328     \@bitor\@currtype\@botlist
329     \if@test
330         \@addtobot
331     \else
332         \ifodd \count\@currbox
333             \advance \@reqcolroom \intextsep
334             \ifdim \@colroom>\@reqcolroom
335                 \global \advance \@colnum \m@ne
336                 \global \advance \@textfloatsheight \ht\@currbox
337                 \global \advance \@textfloatsheight 2\intextsep
338                 \@cons \@midlist \@currbox
339                 \if@nobreak
340                     \nobreak
341                     \@nobreakfalse
342                     \everypar{}%
343                 \else
344                     \addpenalty \interlinepenalty
345                 \fi
346                 \vskip \intextsep
347                 \box\@currbox
348                 \penalty\interlinepenalty
349                 \vskip\intextsep
350                 \ifnum\outputpenalty <-\@Mii \vskip -\parskip\fi
351                 \outputpenalty \z@
352                 \inserttrue
353             \fi
354         \fi
355     \if@insert
356     \else
357         \@addtotoporbot
358     \fi
359     \fi
360 \fi
361 \fi
362 \fi

```

```

363     \fi
364 \fi
365 \if@insert
366 \else
367     \@resethfps
368     \@cons\@deferlist\@currbox
369 \fi
370 }%

```

`\@addtotoporbot` With adds to support dblfloat(s) placement on the current page and at the page bottom.

```

371 \def \@addtotoporbot {%
372     \@getfpsbit \tw@
373     \ifodd \@tempcnta
374         \@flsetnum \@topnum
375         \ifnum \@topnum>\z@
376             \@tempwafalse
377             \@flcheckspace \@toproom \@toplist
378             \if@tempswa
379                 \@bitor\@currtype{\@midlist\@botlist\@dblbotlist}%
380                 \if@test
381                     \else
382                         \@flupdates \@topnum \@toproom \@toplist
383                         \@inserttrue
384                 \fi
385             \fi
386         \fi
387     \fi
388 \if@insert
389 \else
390     \@addtobot
391 \fi
392 }

```

`\@addtobot` With adds to support dblfloat(s) placement on the current page and at the page bottom.

```

393 \def \@addtobot {%
394     \@getfpsbit 4\relax
395     \ifodd \@tempcnta
396         \@flsetnum \@botnum
397         \ifnum \@botnum>\z@
398             \@tempwafalse
399             \@flcheckspace \@botroom \@botlist
400             \if@tempswa
401                 \@bitor\@currtype{\@dblbotlist}%
402                 \if@test
403                     \else
404                         \global \maxdepth \z@
405                         \@flupdates \@botnum \@botroom \@botlist

```

```

406         \@inserttrue
407     \fi
408 \fi
409 \fi
410 \fi
411 }

```

`\@doclearpage` With adds to support dblfloat(s) placement on the current page and at the page bottom.

```

412 \def \@doclearpage {%
413     \ifvoid\footins
414         \ifvbox\@kludgeins
415             {\setbox \@tempboxa \box \@kludgeins}%
416         \fi
417         \setbox\@tempboxa\vsplit\@ccclv to\z@ \unvbox\@tempboxa
418         \setbox\@tempboxa\box\@ccclv
419         \if@twocolumn
420             \xdef\@topbotlist{\@toplist\@botlist}%
421             \global \let \@toplist \empty
422             \global \let \@botlist \empty
423             \global \colroom \colht
424             \ifx \@currlist\empty
425                 \else
426                     \@latexerr{Float(s) lost}\@ehb
427                     \global \let \@currlist \empty
428                 \fi
429             \@makefcolumn\@topbotlist
430             \@whilesw\if@fcolmade \fi{\@opcol\@makefcolumn\@topbotlist}%
431             \if@firstcolumn
432                 \xdef\@deferlist{\@dbltoplist\@dblbotlist\@deferlist}%
433                 \global \let \@dbltoplist \empty
434                 \global \let \@dblbotlist \empty
435                 \global \colht \textheight
436                 \begingroup
437                     \@dblfloatplacement
438                     \@makefcolumn\@deferlist
439                     \@whilesw\if@fcolmade \fi{\@outputpage
440                         \@makefcolumn\@deferlist}%
441                 \endgroup
442             \else
443                 \vbox{}\clearpage
444             \fi
445         \else
446             \xdef\@deferlist{\@toplist\@botlist\@deferlist}%
447             \global \let \@toplist \empty
448             \global \let \@botlist \empty
449             \global \colroom \colht
450             \ifx \@currlist\empty
451                 \else
452                     \@latexerr{Float(s) lost}\@ehb

```

```

453         \global \let \@currlist \@empty
454     \fi
455     \@makefcolumn\@deferlist
456     \@whiles\if@fcolmade \fi{\@opcol\@makefcolumn\@deferlist}%
457 \fi
458 \else
459     \setbox\@cclv\vbox{\box\@cclv\vfil}%
460     \@makecol\@opcol
461     \clearpage
462 \fi
463 }
464 %%% > 2015 end
465 \fi

```

`\@combinedblfloats` Combines outputbox with top and bottom placed dblfloat(s).

```

466 \def\@combinedblfloats{%
467 \ifx \@dbltoplist\@empty \else \@cdblflt \fi
468 \ifx \@dblbotlist\@empty \else \@cdblflb \fi
469 }

```

`\@cdblflt` Combines outputbox with top placed dblfloat(s).

```

470 \def\@cdblflt{%
471 \setbox\@tempboxa \vbox{}%
472 \let \@elt \@comdblflflt
473 \@dbltoplist
474 \let \@elt \relax
475 \xdef \@freelist {\@freelist\@dbltoplist}%
476 \global\let \@dbltoplist \@empty
477 \setbox\@outputbox \vbox% to\textheight
478 {\boxmaxdepth\maxdepth %% probably not needed, CAR
479 \unvbox\@tempboxa\vskip-\dblfloatsep
480 \ifnum \@dbltopnum>\m@ne
481 \dblfigrule
482 \fi
483 \vskip \dbltextfloatsep
484 \unvbox \@outputbox
485 }%
486 }

```

`\@cdblflb` Combines outputbox with bottom placed dblfloat(s).

```

487 \def\@cdblflb{%
488 \setbox\@tempboxa \vbox{}%
489 \let \@elt \@comdblflflt
490 \@dblbotlist
491 \let \@elt \relax
492 \xdef \@freelist {\@freelist\@dblbotlist}%
493 \global\let \@dblbotlist \@empty
494 \setbox\@outputbox \vbox% to\textheight
495 {\boxmaxdepth\maxdepth %% probably not needed, CAR

```

```

496     \unvbox\@outputbox
497     \vskip \dbltextfloatsep
498     \ifnum \@dblbotnum>\m@ne
499         \dblfigrule
500     \fi
501     \unvbox\@tempboxa
502     \vskip -\dblfloatsep
503     }%
504 }

```

Makes \@makecol current definition copy to \org@makecol.

```
505 \global\let\org@makecol\@makecol
```

\fn@makecol Redefined macro \@makecol which puts footnotes below the bottom floats.

```

506 \gdef \fn@makecol {%
507     \setbox\@outputbox \box\@cclv
508     \let\@elt\relax
509     \xdef\@freelist{\@freelist\@midlist}%
510     \global \let \@midlist \@empty
511     \@combinefloats
512     \ifvoid\footins
513     \else
514         \setbox\@outputbox \vbox {%
515             \boxmaxdepth \@maxdepth
516             \unvbox \@outputbox
517             \vskip \skip\footins
518             \color@begingroup
519                 \normalcolor
520                 \footnoterule
521                 \unvbox \footins
522             \color@endgroup
523         }%
524     \fi
525     \ifvbox\@kludgeins
526         \@makespecialcolbox
527     \else
528         \setbox\@outputbox \vbox to\@colht {%
529             \@texttop
530             \dimen@ \dp\@outputbox
531             \unvbox \@outputbox
532             \vskip -\dimen@
533             \@textbottom
534         }%
535     \fi
536     \global \maxdepth \@maxdepth
537 }

```

\fnbelowfloat Switch to put footnotes below the bottom floats.

```
538 \def\fnbelowfloat{\global\let\@makecol\fn@makecol}
```

`\fnunderfloat` Switch to put footnotes under the bottom floats.
539 `\def\fnunderfloat{\global\let\@makecol\org@makecol}`

`\set@floatfontsize` Such definition `\baselineskip\@linespread\baselineskip` removes any glue from the `\baselineskip` in the case `\@linespread` is not empty. To prevent this `\size@update` is redefined.
540 `\def\set@floatfontsize#1#2#3{%`
541 `\@defaultunits\@tempdimb#2pt\relax\@nnil`
542 `\edef\@size{\strip@pt\@tempdimb}%`
543 `\@defaultunits\@tempkipa#3pt\relax\@nnil`
544 `\edef\@baselineskip{\the\@tempkipa}%`
545 `\edef\@linespread{#1}%`
546 `\let\baselinestretch\@linespread`
547 `\def\size@update{%`
Saving of the `\baselineskip` glue.
548 `\baselineskip\@baselineskip`
549 `\@tempkipa\baselineskip\relax\baselineskip=1\baselineskip`
550 `\advance\@tempkipa by-\baselineskip\baselineskip\@baselineskip`
Removes the `\baselineskip` glue in case `\@linespread` not empty.
551 `\baselineskip\@linespread\baselineskip`
Restoring of the `\baselineskip` glue.
552 `\advance\@tempkipa by\baselineskip\baselineskip\@tempkipa`
553 `\normalbaselineskip\baselineskip`
554 `\setbox\strutbox\hbox{%`
555 `\vrule\@height.7\baselineskip`
556 `\@depth.3\baselineskip`
557 `\@width\z@}%`
558 `\let\size@update\relax`
559 `}%`
560 `}`

Simple copy of the previous original `\set@fontsize` definition in `\set@@@fontsize`.
561 `\let\set@@@fontsize\set@fontsize`

`\setbaselinefloat` It allows `\baselineskip` to be set to the value with glue.
562 `\def\setbaselinefloat{\let\set@fontsize\set@floatfontsize}`

`\setbaselinefixed` It is used to restore macro definition `\set@fontsize` to the original one. It means that `\baselineskip` is set to the value without glue in the case `\baselinestretch` is not empty.
563 `\def\setbaselinefixed{%`
564 `\@tempdima=\baselinestretch\p@`
565 `\edef\baselinestretch{\strip@pt\@tempdima}%`
566 `\let\set@fontsize\set@@@fontsize`
567 `}`

`\output` It is removed from this package as the duplicate of the same definition in kernel since the macro definition change v.1.2c at 1997/11/09 in `ltoutput`.

568 `%\endinput`